THE VETERINARY BULLETIN

1935.

VOLUME V

WEYBRIDGE:
IMPERIAL BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Digitized by the Internet Archive
in 2025

https://archive.org/details/veterinary-bulletin_1935-01_5_1

Imperial Agricultural Bureaux.

EXECUTIVE COUNCIL.

Sir CHARLES J. HOWELL THOMAS, K.C.B., K.C.M.G. *Chairman*	United Kingdom
N. L. WRIGHT, F.I.C., *Vice-Chairman*	New Zealand.
Colonel GEORGE P. VANIER, D.S.O., M.C.	Canada.
F. L. McDOUGALL, C.M.G.	Australia.
F. J. DU TOIT	South Africa.
J. M. ADAMS, F.R.C.Sc. (I)	Irish Free State.
Sir BHUPENDRA NATH MITRA, K.C.S.I., K.C.I.E., C.B.E., High Commissioner	India
B. F. WRIGHT...	Southern Rhodesia.
R. V. VERNON, C.B.	Colonies, Protectorates and Mandated Territories.
Sir DAVID CHADWICK, C.S.I., C.I.E.	Secretary.

STAFF OF IMPERIAL BUREAU OF ANIMAL HEALTH, WEYBRIDGE.

Director:

W. HORNER ANDREWS, D.Sc., M.R.C.V.S.

Deputy Director and
Editor of The Veterinary Bulletin and of Index Veterinarius:

W. A. POOL, M.R.C.V.S.

Second Officer:

J. TWEEDALE EDWARDS, M.R.C.V.S.

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 5.] January, 1935. [No. 1.

LIST OF PUBLICATIONS INDEXED AND SURVEYED BY THE IMPERIAL BUREAU OF ANIMAL HEALTH.

ADDITIONS TO LISTS PUBLISHED IN THE VETERINARY BULLETIN VOL. 3, p. 1 AND VOL. 4, p. 1.

EUROPE.

BELGIUM.

Vlaamsch Diergeneeskundig Tijdschrift.

DENMARK.

Medlemsblad for den danske Dyrlaegeforening.

GERMANY.

Archiv für Tiernährung und Tierzucht.

Pflügers Archiv für die gesamte Physiologie der Menschen und der Tiere.

Virchows Archiv für pathologische Anatomie und Physiologie und für klinische Medizin.

Zeitschrift für Immunitätsforschung und experimentelle Therapie.

Zeitschrift für Parasitenkunde.

LITHUANIA.

Veterinarija ir Zootechnija.

ASIA.

PHILLIPINE ISLANDS.

The Philippine Journal of Animal Industry [*continuation of* The Gazette, Bureau of Animal Industry].

SOUTH AMERICA.

BRAZIL.

Biologia Medica.

Boletim veterinário do Exército.

Revista do Departmento nacional da Produção Animal [*continuation of* Revista de Zootecnia e Veterinaria].

PERU.

Boletin de la Direccion de Agricultura y Ganaderia.

DISEASES CAUSED BY BACTERIA AND FUNGI.

BARTELS, E., & SCHULZE-GAHMEN, J. (1934). Ergebnisse der im Jahre 1933 im Regierungsbezirk Schleswig angestellten Versuche mit der intrakutanen Milzbrandschutsimpfung nach Besredka. [**Results of Intradermal Anthrax Vaccination in Schleswig in 1933**].—*Dtsch. tierärztl. Wschr.* **42.** 337-338. [1 ref.]

In 1933, 394 cattle and 10 horses were vaccinated against anthrax by Besredka's intradermal method. One bovine died of anthrax, following the first injection, but the authors state that death was not due to the inoculation.—J. E.

CORMIO, A. (1933). Sulla frequenza del bacillo tubercolare nei gangli normali dei bovini e dei suini. [**Occurrence of** *Mycobacterium tuberculosis* **in the Normal Lymph Glands of Cattle and Pigs**].—*Boll. Ist. sieroter. Milano.* **12.** 481-488. [16 refs.] [Abst. from abst. in *Zlb. Bakt. I. (Ref.).* **112.** 524-525].

Cultures on Petragnani's medium, prepared from the lymph glands of 26 out of 30 apparently disease-free cattle, gave colonies of tubercle bacilli. Similar cultures from two out of ten pigs were positive. [The abstract gives no information on biological tests to prove identity]. Four strains from the above series were said to be transition types between *Mycobact. tuberculosis* and *M. paratuberculosis*.—J. E.

STEIN, C. D. (1933). **Human and Avian Types of Tubercle Bacilli Recovered from Swine.**—*J. Amer. vet. med. Ass.* **83.** 105-109. 2 tables.

The author records the isolation of a human strain of tubercle bacillus from the lymphatic glands of a garbage-fed pig.—T. M. DOYLE.

WESTENRIJK, N. (1933). Untersuchungen über Immunisierung gegen Tuberkulose durch Inhalation von abgetöteten Tuberkelbacillen. I. Mitteilung. [**Immunization against Tuberculosis by Inhalation of Killed Tubercle Bacilli**].—*Beitr. Klin. Tuberk.* **83.** 515. [Copied *verbatim* from *Bull. Hyg., Lond.* **9.** 640. Signed by S. Roodhouse Gloyne].

In this article the author records a series of experiments designed to immunize rabbits with young dead tubercle bacilli. The immunization was carried out by causing the animals to inhale the vaccines of dead bacilli by means of an electrically driven vaporization apparatus. The vaccines used in the spray were first a sputum culture – Sputum Gr – and then a strain " Rippentuberkulose Hohn," followed finally by a bovine strain. The animals received a preliminary test with tuberculin and after the spray experiments were concluded weight tests, complement fixation and estimation of phagocytosis were carried out. The animals were then given an infective spraying with living bacilli (bovine strain " Fari "). Twenty-two rabbits were treated in this way and a further 8 given an infective spray dose only as controls. Eight of the treated animals survived to the end of the experiment and when killed showed no macro- or microscopic lesions of tuberculosis, whereas all the controls developed tuberculosis. The most important factor of resistance appeared to be that of cellular immunity.

VAN OIJEN, C. F. (1933). De methode Löwenstein tot het kweeken van tuberkelbacillen uit bloed, toegepast bij dieren. [**Löwenstein's Blood Culture Method for Tubercle Bacilli Applied to Animals**].—*Tijdschr. Diergeneesk.* **60.** 809-814. 1 table. [English, French and German summaries : abst. from orig.]

The author was unable to obtain tubercle bacilli from the blood of a calf fed

for four months on food containing tubercle bacilli. In a second calf, given an intravenous injection of tubercle bacilli, the organisms were recovered on the 10th, 16th, 18th and 20th days after inoculation : in another similar case the bacteria were not recovered until the 26th day after infection.

Blood culture was negative in 20 natural cases of tuberculosis in cattle.—J. E.

RINJARD, P. (1934). La paratuberculose bovine en France. Epidémiologie et prophylaxie. [**Johne's Disease in France**].—*Bull. Off. internat. Epiz.* **8.** 326-353. 3 tables. [7 refs.]

The author notes that, whereas *Mycobact. paratuberculosis* infection [Johne's disease] was extremely limited in France 20 years ago, it is now comparatively prevalent, reports of its existence having been recently received from 21 departments.

For the systematic control of the disease, the use of a special form of johnin coupled with the application of a vaccine is recommended. The johnin, which has already been described [VALLÉE, & RINJARD. (1926). *Rev. gén. méd. vét.* **35.** 1.], is prepared by the maceration at low temperature in carbol saline of cultures obtained from solid media, followed by filtration through a candle. The product is tested on allergic animals and is applied intradermally in the subcaudal fold. Care should be taken that the johnin is not too concentrated, otherwise difficulty may be experienced with tuberculin-positive animals. With a properly standardized johnin, the reactions are regarded as specific.

It is pointed out that the johnin test is practically valueless in advanced cases of the disease, giving an error of 80 per cent., but in the preclinical stage it is highly reliable. For this reason, it is suggested that the application of the johnin test should be restricted to the detection and removal of the early cases of the disease.

The vaccine employed for the " premunition " of suitable animals in infected localities is prepared by emulsifying 5 to 15 mg. of *M. paratuberculosis* with 10 to 20 mg. of inert powder in 2 c.c. of a mixture of olive oil and liquid paraffin. The innocuousness of this vaccine has been demonstrated both on experimental animals and in the field : 35,000 injections have been made. After subcutaneous inoculation an oedematous swelling is produced leading to the formation, in from four to six weeks, of a firm encapsulated lesion.

This reaction is not observed in animals affected with Johne's disease or in an active stage of " premunition " ; in these there is an entire absence of a local reaction, or a small purulent lesion is formed which ruptures through the skin. A difficulty arises, therefore, with this method, in determining the precise period at which vaccinated animals should be reinoculated.

Up to the end of 1932, 6,850 animals, distributed through 168 herds, had been vaccinated. No case of Johne's disease had been reported in any beast properly " premunized." In 1933, 9,678 animals were vaccinated with satisfactory results to date.—R. E. GLOVER.

I. —. (1934). **Discussion on Corynebacterium Infections, with Special Reference to Caseous Lymphadenitis of Sheep.**—*Proc. R. Soc. Med.* **27.** 1335-1344. [21 refs.]

II. MISSENARD. (1934). Lymphadénie caséeuse du Mouton. [**Caseous Lymphadenitis in Sheep**].—*Bull. Acad. vét. Fr.* **7.** 195.

I. This discussion on corynebacteria was opened by J. B. BUXTON, who, after dealing with the general characters of the group, gave a brief résumé of the modern literature on caseous lymphadenitis in the sheep. The distribution of the disease, nature of the lesions and pathogenicity of the organism were described ;

under the latter heading, the high susceptibility of English sheep to experimental infection was mentioned. The methods of spread were noted and the suggestion made that biting insects might act as vectors of the organism.

CARNE observed that much confusion had arisen between *C. pyogenes* and *C. ovis*. An examination of 60 Australian strains of the latter organism showed that all liquified gelatine when grown on slopes. Other biochemical reactions were also constant. Certain strains formed a haemolysin capable of inducing haemolysis and icterus in sheep after intravenous inoculation. This haemolysin appeared to be unrelated to exotoxin or to virulence. The organism remained alive for long periods in caseopurulent material even when desiccated.

With regard to methods of transmission, the observation that the organism could lead a saprophytic existence in soil and faeces, and multiply under suitable external conditions, suggested that the earlier views on the contamination of wounds during shearing etc. might require modification.

Subsequent speakers dealt with a group of diphtheroid organisms found in human beings, which appear to be intermediate between *C. diphtheriae* and *C. ovis*.

II. A very brief account of the organisms which are found in caseous lymphadenitis in Sudanese sheep and goats.—R. E. GLOVER.

SEIJFFERS, S. M. (1934). Rapport omtrent de eerste vaccinatie tegen septichaemia epizoötica van den buffel- en varkensstapel in een gedeelte der onderafdeeling Makale – Rantepao (afdeeling Loewoe; Gewest Celebes en Onderhoorigheden) in April en Mei 1933. [**Report of the First Vaccination against Haemorrhagic Septicaemia in Buffaloes and Pigs in the Island of Celebes in April and May 1933**].—*Ned.-ind. Bl. Diergeneesk.* **46.** 46-62. 2 tables.

An investigation on the effect of vaccine treatment [exact method not given] in the control of haemorrhagic septicaemia was carried out on about 5,000 pigs, over 1,000 buffaloes and 45 cows, in a district of the island of Celebes [Dutch East Indies], where this disease is common. The animals were vaccinated twice, namely in the months of April/May and October/November. No severe reactions were observed. Five buffaloes and two pigs died within six days after vaccination and ten buffaloes and one pig died at a later period, but at autopsy most of these animals did not show any sign of infection.

Haemorrhagic septicaemia has not been detected in vaccinated animals for the past six months. In 1931, 1932 and 1933, 157, 114 and 16 cases of haemorrhagic septicaemia occurred respectively in buffaloes, while 125, 213 and 33 cases occurred respectively in pigs [vaccination was performed for the first time in 1933]. The author considers these data to indicate that the vaccination may be of importance for the control of the disease, and that further application of vaccination is desirable.—J. VAN DER HOEDEN (UTRECHT).

I. HENNING, M. W., & COLES, J. D. W. A. (1933). **On Fowl Cholera in South Africa.**—*J. S. Afr. vet. med. Ass.* **4.** 166-169. [7 refs.]

II. MIGGE. (1933). Das Virus der Wild- und Rinderseuche. [**The Cause of Bovine Haemorrhagic Septicaemia**].—*Berl. tierärztl. Wschr.* **49.** 821-824.

III. SEMELAGNE. (1934). Contribution à l'étude de la pasteurellose des Bovidés. [**Pasteurellosis of Cattle**].—*Bull. Acad. vét. Fr.* **7.** 80-85.

I. The present authors give a record of the available information on the occurrence of fowl cholera in South Africa. There is evidence that the disease has existed in an acute form, in different parts of the country, during the last 23 years.

They studied an organism isolated from a fatal disease in ducks and found it to be pathogenic for rabbits, white mice, fowls and ducks. Morphologically, culturally and biochemically, it was indistinguishable from *Pasteurella aviseptica*, and the disease which it produced resembled fowl cholera. Reference is made to the condition known as wattle oedema and to its relationship to fowl cholera. A number of cases were studied and cultural examinations gave negative results.

II. The author discusses the viability of this pasteurella species which affects cattle and wild animals (deer and wild pigs). He gives the histories of four outbreaks of bovine pasteurellosis, and concludes that the virulence of the organism may be maintained for long periods in buildings, on pasture or in the soil. In the outbreaks described this was maintained for from seven months to two years. The author draws attention to the similar pathological changes in *Past. boviseptica* infection of cattle and pigs ; he notes that in outbreaks of the disease in cattle, secondary outbreaks readily occur in pigs and *vice versa*.

In swine plague [*Past. suiseptica* infection] the causative organism confines its pathogenic activities to the porcine species and skin swellings, which are a conspicuous feature of *Past. boviseptica* infection in swine, are never noticed. The lesions which prevail in swine plague (excepting the peracute septicaemic cases) and septic pneumonia of calves are distinguishable from those of pasteurellosis of oxen and swine.

The author believes that the bipolar bacteria are varieties of the same species, and that a changing degree of virulence of any one variety is a result of mutation.

III. A critical review is given of a thesis submitted by Semelagne for the Emil Thierry prize. The epidemiological origin of bovine pasteurellosis, its symptomatology, pathology, diagnosis and differential diagnosis from contagious bovine pleuro-pneumonia are discussed. Special consideration was given to the treatment of affected animals. It was found that "novarsenobenzol", in a dose of 1 g. per 200 kg. body weight, with injections of caffeine and camphorated oil, gave excellent results in the case of animals newly affected.

"Atoxyl", injected subcutaneously in the same dose as above, or 3 g. for those animals over 500 kg. body weight, gives equally good results, and obviates any risk of anaphylactic conditions produced by the former drug when repeated injections are necessary.—D. R. Wilson.

Clarenburg, A. (1934). Bacteriologische- en serologische onderzoekingen bij klinisch gezonde runderen op de aanwezigheid van paratyphusbacillen in de faeces en paratyphusagglutininen in het bloed. **[The Presence of Paratyphoid Bacteria in the Faeces and Paratyphoid Agglutinins in the Blood of Clinically Healthy Cattle]**.—*Tijdschr. Diergeneesk.* **61.** 335-349. 3 tables. [14 refs.] [English, French and German summaries : abst. from orig.]

The faeces of 208 slaughter cattle were examined for salmonella bacteria and their serum was examined for agglutinins of the Aertrycke, Schottmüller and Gärtner types of salmonella. *Bact. enteritidis* (Gärtner) was found in the faeces of three animals and its agglutinins in one of these animals and in a calf. Apart from these animals, normal agglutinins were present in 134 beasts. Normal agglutinins could easily be differentiated from immune agglutinins by absorption tests or by inactivating the sera. No ubiquity of paratyphoid bacteria could be found.—J. van der Hoeden (Utrecht).

Rievel, H. (1934). Kontrollversuche an Hühnern, die durch die Frischblutagglutination als pulloruminfiziert ermittelt wurden. **[Control Test on Fowls Shown by the Rapid Blood Test to be Infected with** *Bact. pullorum***]**.—*Deuts. tierärztl. Wschr.* **42.** 97-100. [29 refs.]

Cultural tests with the blood and faeces of seven hens, all positive reactors to the agglutination test, for *Bact. pullorum*, were carried out monthly for six months, the results always being negative. The hens laid 68 eggs, from two of which *Bact. sanguinarium* was isolated. When the hens were killed six of them showed the typical pathological changes of pullorum disease and from four of them *Bact. pullorum* (two cases each of types A and B) was isolated and from one *Bact. sanguinarium* type A. During life the tube agglutination reactions rose in titre steadily and the rapid whole blood test was in agreement to the extent of 90 per cent. of cases.—J. E.

GÜNTHER, K. (1933). Vergleichende Untersuchungen über das Bacterium pullorum Rettger (1909) und das Bacterium sanguinarium Klein (1889). [**Comparative Tests on** *Bact. pullorum* **and** *Bact. sanguinarium*].—*Zlb. Bakt. I. (Orig.).* **128.** 197-204. 2 tables. [4 refs.]

Forty-seven strains of *Bact. pullorum* and *Bact. sanguinarium* obtained from Germany, England and America were compared culturally, serologically and by animal inoculation. The two latter methods gave no data for differentiation and by the results of cultural tests [see the original] the author divided the strains into *Bact. pullorum* A and B and *Bact. sanguinarium* A and B, the A types in each case being gas formers. Dulcite and litmus milk are said to be valuable in differentiating these two organisms.—J. E.

[Most German workers regard *Bact. pullorum* and *Bact. sanguinarium* as being identical, whereas in Great Britain and America the two organisms are considered to be separate entities.

Bacillary white diarrhoea (*Bact. pullorum* infection) is an acute infection of young chicks characterized by a high mortality within the first week of birth. A varying percentage of adult fowls on infected farms carry the infection, but rarely exhibit symptoms. The frequently repeated statement that *Bact. pullorum* may occasionally be the cause of a heavy mortality among adult birds is open to doubt. A heavy mortality has been reported among adult fowls from the ingestion of incubated eggs infected with *Bact. pullorum*, but that is tantamount to artificial infection.

Avian typhoid (*Bact. sanguinarium* infection) is essentially a disease of fowls over three months old, but the infection occasionally occurs among young chicks.

As many as 20 per cent. of the eggs laid by fowls infected with *Bact. pullorum* may contain the organism, but although *Bact. sanguinarium* has been isolated from the ovaries of fowls, there is apparently no record of it having been isolated from eggs. Although *Bact. pullorum* and *Bact. sanguinarium* cannot be differentiated by serological tests, they may be distinguished by their action on sugar media. *Bact. pullorum* may or may not produce gas with certain sugars, whereas *Bact. sanguinarium* does not produce gas with any sugar in common use. *Bact. pullorum* turns litmus milk slightly acid, while *Bact. sanguinarium* renders it strongly alkaline. Dulcite is fermented by *Bact. sanguinarium* and not by *Bact. pullorum*. *Bact. sanguinarium* when grown in maltose gives a positive reaction with methyl red, whereas *Bact. pullorum* invariably fails to do so.—T. M. D.]

DUNNING, F. J. (1934). **Observations on Keel Disease in Ducklings Occurring in South Africa.**—*Vet. Rec.* **14.** 423-424. [3 refs.]

In September, 1931, a poultry farmer incubated some 2,000 ducks' eggs in incubators used a short time previously for hens' eggs. One thousand ducklings died within three weeks of hatching and keel disease was diagnosed at the Onderste-

poort laboratory. Fourteen newly hatched ducklings, which were immediately removed and well cared for, also died – a fact pointing to egg infection.

In November, 1931, six dozen ducks' eggs were sent from the same farm to another farm and the 60 ducklings which were hatched nearly all died of keel disease. The disease did not recur in 1932 at either farm. No eggs were examined bacteriologically.—J. E.

I. MORIN, L. N. (1933). **Swine Abortion.**—*N. Amer. Vet.* **14.** No. 8. 28-30.
II. BECKETT, E. F. (1934). **Necrotic Enteritis (Paratyphoid) and its Differential Diagnosis.**—*Vet. J.* **90.** 113-119.

I. Eight outbreaks of abortion occurred in a well-managed herd during the period 1921-1932. As attempts to control the disease during these years, the sows were inoculated with " bovine mixed abortion bacterin, mixed enteritis bacterin, so-called swine abortion bacterin and live bovine abortion culture " (inoculated thirty days before sows were bred). These all failed to stop the outbreaks, though some reduction in the abortion rate followed the use of the first, second and fourth mentioned vaccines.

In 1931, in the same herd, an outbreak of enteritis occurred, which was shown to be due to *Bact. paratyphosum* B infection. Also in 1932, aborted foetuses were shown to contain *Bact. paratyphosum* B. An autogenous bacterin, prepared from the organisms isolated from the foetuses, was then tried. This resulted in many abortions during the three days subsequent to the inoculation, followed by complete cessation of the abortions. The sows which aborted following paratyphoid B. vaccination, on being rebred, did not abort, and also the vaccinated sows produced stronger litters than had previously been obtained.

II. The author is convinced that *Salmonella* [*Bacterium*] *suipestifer* can be pathogenic for swine in the absence of swine fever virus. He gives details of the management of a large herd in which, seven years after its foundation, this disease became a source of great loss. At first, pigs of ten to 12 weeks old became affected and, later, animals up to six months old. Adult pigs were never affected. Listlessness, general unthriftiness, " thumps " and profuse diarrhoea were the symptoms noticed. The pigs died after an acute illness, or lingered on to die eventually from weakness and exhaustion.

In the younger pigs, *post-mortem* examination revealed dilated heart, effusions into the serous cavities, oedematous lungs and acute inflammation of the intestine. The older pigs showed a varying degree of pneumonia and diphtheritic enteritis. Ascarid worms were invariably present. Contrary to the findings in swine fever, the kidneys were pale with few, if any, petechiae, and the button ulcers with concentric rings and central depression were not present. The distinguishing features of swine erysipelas and anthrax are pointed out.—A. BROWNLEE.

FINZI, G. (1934). La malattia di Bang nei bovini. [*Br. abortus* **Infection in Cattle**].—*Profilassi.* **7.** 281-288. [7 refs.] [Abst. from English and French summaries].

A general note on diagnostic methods for bovine contagious abortion with particular reference to the intradermal test which, in the author's opinion, is reliable. Standardization of the antigen is, however, urgently necessary. Reference is also made to chemotherapy and vaccination.—J. E.

CARNEIRO, V. (1933). Em torno da febre ondulante. Brucelose bovina e sua frequencia em S. Paulo. [**Bovine** *Brucella abortus* **Infection in Sao Paulo**]. —*Rev. Soc. paul. Med. vet.* **3.** 126-133. 2 tables. [French summary: abst. from orig.]

This is a general article, but includes results of agglutination tests for brucella infection on 428 bovine and 42 caprine sera. The samples had been taken at random. One goat reacted and infection was present in one out of three herds tested. Forty-one (9·3 per cent.) of the bovine sera were positive in higher titres than 1 : 100, and 22 in lower titres ; 10 out of 25 farms were infected.

—R. S. Roberts.

I Feldman, W. H., & Olson, C., Jr. (1934). **The Reaction of Swine Following Experimental Inoculation of a Pathogenic Strain of Brucella abortus of Porcine Origin.**—*J. Amer. vet. med. Ass.* **85.** 64-75. 1 table. [14 refs.]

II. Doyle, T. M. (1934). **A Survey for the Presence of Brucella Agglutinins in Pigs' Blood in Great Britain.**—*J. comp. Path.* **47.** 134-140. 1 table. [19 refs.]

I. Feldman and Olson inoculated eight pigs to test the pathogenicity of a *Brucella abortus* strain of porcine origin isolated from a case of spondylitis. Two animals were inoculated intravenously, two orally, two subcutaneously and two through the conjunctiva. Although sera from the inoculated animals gave positive agglutination reactions, no visible lesions of infection were found on autopsy 319 days after inoculation.

Attempts to isolate brucella by the inoculation of guinea pigs with suspensions of the pigs' spleens gave negative results. The intracardial inoculation of a pregnant sow with 1 c.c. of a 48-hour culture of the organism caused abortion in 11 days.

II. The author surveys briefly the literature dealing with brucella infection of pigs. He submitted the blood of 10,474 sows to the agglutination test for the presence of brucella agglutinins. Four bloods gave positive reactions in dilutions of 1 : 25, 17 gave positive reactions in dilutions of 1 : 50, and four gave positive reactions in dilutions of 1 : 100. Positive reactions in dilutions of 1 : 100 are generally regarded as an indication of existing or recent infection with *Br. abortus* (porcine strain).—T. M. Doyle.

Amoia, R. (1933). Observations sur l'agglutination par les " brucelles." **[Observations on Agglutination by Brucella].**—*Boll. Sez. ital. Soc. internaz. Microbiol.* **5.** 171-174. [4 refs.] [In French.]

Amoia gave two rabbits seven intravenous injections at five-day intervals of heat-killed cultures of *Br. abortus* and *Br. melitensis* respectively. At the end of this period the blood titres were 1 : 1,200 for *Br. abortus* and 1 : 1,600 for *Br. melitensis*. After an interval of 60 days the blood titres of both rabbits became negative.

The two rabbits were then given three intravenous inoculations of *Bact. typhosum* cultures and these injections resuscitated the agglutinins for the brucella in a titre of 1 : 100 ; the same serum agglutinated *Bact. typhosum* antigen to 1 : 200.

This shows that brucella agglutinins do not persist for long in the system of rabbits and that inoculation with another antigen may to some extent reawaken them.—T. M. Doyle.

Wallace, G. I., Cahn, A. R., & Thomas, L. J. (1933). **Klebsiella paralytica. A New Pathogenic Bacterium from "Moose Disease."**—*J. Infect. Dis.* **53.** 386-414. 1 fig., 1 table. [22 refs.]

A disease affecting moose [this *Bull.* **3.** 427.] in which paralytic symptoms are prominent, occurs in the Canadian-Minnesota country, and ticks (*Dermacentor albipictus*) taken from diseased animals and placed on laboratory animals produced symptoms similar to those of " moose disease." It was concluded that the infective

agent was transmitted from *D. albipictus* to the experimental animal. A bacterium was isolated from the intestinal contents of ticks which had fed on diseased moose, and inoculation of this organism into experimental animals produced violent reactions. Broth culture filtrates of the organism (*Klebsiella paralytica*) when injected, produced similar results. The symptoms were in many cases similar to those exhibited by diseased moose. Whilst the authors have not proved that *K. paralytica* is the cause of moose disease, the observations strongly support some aetiological relationship. The relationship of the disease to tick paralysis is also discussed.—R. LOVELL.

OXER, D. T. (1933). **Peculiar Circumstances Attending an Outbreak of Entero-Toxaemia in Lambs.**—*Aust. vet. J.* **9.** 212-215. [4 refs.]

The most important conditions predisposing to entero-toxaemia have been considered to be rapid development and fat condition of lambs, these usually being associated with young rich pasture and a copious supply of milk from the ewes. An outbreak of the disease is recorded which was unusual in that it occurred at a time when the danger period would usually be considered to have passed : the affected lambs were not in prime condition, the grasses had for most part dried off, and the ewes were giving only a small supply of milk. The available data concerning the conditions leading to entero-toxaemia are discussed and it is considered that a drastic change in normal bowel function, caused by rapidly changing conditions of feeding, is the important factor. Although the outbreak recorded here occurred under unusual circumstances, there was at the time a change in diet owing to the rapid drying off of the grass, which lends support to this hypothesis.—W. I. B. BEVERIDGE.

I. BORTHWICK, G. R. (1934). **Some Factors Predisposing to Infection by *Vibrion* [*Clostridium*] *septique* from the Alimentary Tract : an Experimental Study.**—*Brit. J. exp. Path.* **15.** 153-160. 2 tables. [10 refs.]

II. HENDERSON, D. W. (1934). **Experiments with the "O" Antigen of *Clostridium oedematis maligni* (*Vibrion septique*).**—*Ibid.* 166-175. 7 tables. [11 refs.]

I. Attention is drawn to a previous communication [this *Bull.* **4.** 409.] in which it was shown that toxic effects following enteral administration of staphylococcal exotoxin to laboratory animals were strictly determined by the pH concentration of the stomach and intestinal contents, and reference is made to the alleged effect of temperature in the aetiology of braxy. The present paper is an account of experiments designed to ascertain the effects of :–(1) pH concentration ; (2) inhibition of peristalsis, and (3) cold, upon the actions of standardized *Cl. septique* toxin and of culture administered by stomach tube to guinea pigs. Preliminary experiments on guinea pigs with X-rays and barium meals and feeding with methylene blue, showed that "narcotine" inhibited peristalsis, but that exposure of the animals to low temperatures made little difference to the rate of food passage.

Groups of 20 to 22 guinea pigs were given concentrated cultures of *Cl. septique* with the following results :–

(1) Gastric contents adjusted to pH 7·6 ...	9·5	per cent. became infected.
(2) Gastric contents maintained at pH 5 ...	14	,, ,, ,,
(3) Guinea pigs treated with "narcotine"	81	,, ,, ,,
(4) "Narcotine," and gastric contents at pH 7·6	75	,, ,, ,,
(5) Guinea pigs exposed to low temperature	50	,, ,, ,,
(6) Exposure to low temperature and gastric contents at pH 7·6	80	,, ,, ,,

(7) Culture administered at 0°C. ... ... 18 per cent. became infected.
(8) Controls (30 guinea pigs) ... ... 3·3 ,, ,, ,,

The author concludes that reduction in the activity of the alimentary tract and, to a less extent, exposure to cold, predispose to infection with *Cl. septique*, but that the pH concentration of the gastric contents is of little importance.

Pathological and histological examination of animals infected by culture indicated the presence of a toxaemic condition.

No disturbance of health occurred in guinea pigs fed with 8 to 10 c.c. of toxin, even when the pH of the stomach contents was adjusted and " narcotine " administered.

II. This paper deals with the experimental study of the antigenic structure of *Cl. septique*, with special reference to the immunizing properties of the " O " antigen. No evidence of immunity was obtained from the subcutaneous inoculation of guinea pigs with massive doses of " O " antigen, prepared by heating washed bacteria at 100°C. for two hours, on three occasions at intervals of a few days, but in a further group of guinea pigs, in which the same immunization process was repeated after 14 days, there appeared to be a considerable degree of immunity. The test inoculation consisted of activated spore suspension. Immunized guinea pigs developed a severe local gangrene but recovered, whereas when gangrene appeared in the control guinea pigs, death invariably occurred.

Other experiments recorded suggest that the immunity is type-specific and that antigenic analysis may be found to yield a basis for the classification of strains of *Cl. septique*.

The author does not suggest the practical application of the method, but is of opinion that the results obtained " establish the importance of the bacillary body in the formolized vaccines of veterinary practice."—R. S. Roberts.

Eales, C. E. (1934). **The Effect of Ferric Chloride on the Toxicity of Clostridium Oedematiens.**—*Aust. vet. J.* **10.** 25-26.

It has been reported by J. P. Scott [(1926). *J. infect. Dis.* **38.** 511.] that the inclusion in the medium of 0·2 per cent. of a ferric salt rapidly increased the virulence of *Clostridium oedematiens*. As some difficulty had been experienced in obtaining highly toxic strains of this organism for the preparation of black disease vaccine, an experiment was conducted to see if this work could be confirmed. Four strains were grown for two generations in medium containing 0·2 per cent. ferric chloride and 0·2 per cent. sodium citrate. However, when filtrates of these cultures were inoculated into guinea pigs the toxicity of the strains was found to have decreased.—W. I. B. Beveridge.

Gilman, H. (1934). **Vibrionic Abortion of Sheep.**—*Cornell Vet.* **24.** 207-209. [8 refs.] [Reprinted *verbatim* in *Rep. New York State Vet. Coll. 1932-1933.* pp. 87-88].

This is a note on the literature and, also, an account of what is believed to be the fourth record of vibrionic abortion of ewes in the United States.

Four ewes imported from Canada aborted in 1932 and four more from the same flock, kept in New York State, aborted in 1933. A pure culture of a vibrio was prepared from three of the aborted lambs.—J. E.

I. Nicolaus, W. (1933). Ueber Histogenese und Altersbestimmung der durch Aspergillus fumigatus hervorgerufenen Veränderungen bei Hühnern. [**Histogenesis and Age Estimation of Changes in Fowls caused by** *Aspergillus fumigatus*].—*Z. InfktKr. Haustiere.* **45.** 191-209. 3 figs., 1 plate, 1 table. [41 refs.]

II. JUNGHERR, E. (1934). **Mycosis in Fowl Caused by Yeast-Like Fungi.**—*J. Amer. vet. med. Ass.* **84.** 500-506. 4 figs. [5 refs.]

I. Fifteen fowls, artificially infected with spores of *Aspergillus fumigatus*, were examined after periods of incubation varying from four hours to 22 days. Young lesions consisted of accumulations of pseudo-eosinophiles. Within 12 hours a central focus of karyorrhexis is to be seen, surrounded by a layer of cells showing pycnotic nuclei ; beyond this layer the tissues, including the neighbouring epithelium, show an accumulation of wandering cells and pseudo-eosinophiles. Later changes include sloughing of the overlying epithelium, widening of all zones, the appearance of conidial fructifications of the fungus within the necrotic central disc, and the appearance of daughter nodules. Finally the necrotic disc becomes extruded towards the surface, whilst a thick layer of fibroid tissue encloses the affected area, developing into a capsule.

Artificial infection can be effected by the inhalation of spores. The inhalation of an artificial irritant such as glass wool assists infection.

II. Yeast-like fungi, belonging to the genera *Monilia* and *Oidium*, have been reported as causes of outbreaks of disease amongst poultry, which have reached epizootic proportions. Cultural differences between *M. albicans*, *M. krusei* and various species of *Oidium*, including *O. pullorum*, are described. Lesions associated with these fungi are found in the mouth, crop, and proventriculus. These consist of whitish, raised, circular ulcers, which ultimately become confluent. The proventricular wall may appear swollen and glossy on its serous surface, which is also characteristic of the condition lymphomatosis.

Fungi belonging to these genera are widely distributed in nature, but it is not known under what conditions they assume invasive properties. They are highly resistant to disinfection with coal tar derivatives.—E. J. PULLINGER.

I. HAUPT, H., & ZEKI, M. (1933). Ist der Erreger der Knochenaktinomykose des Rindes zur Gattung Actinomyces oder zur Gattung Corynebacterium zu stellen ? [**Is Bone Actinomycosis of Cattle caused by Actinomyces or Corynebacterium ?**]—*Zlb. Bakt. I.* (*Orig.*). **130.** 91-102. [37 refs.]

II. KLIMMER, M. (1934). Zur Aetiologie der Aktinomykose der Tiere. [**Aetiology of Animal Actinomycosis**].—*Berl. tierärztl. Wschr.* **50.** 145-151. 2 tables. [102 refs.]

III. SMITH, H. (1934). **Two Cases of Actinomycotic Mastitis.**—*J. Amer. vet. med. Ass.* **84.** 635-644. 3 figs. [10 refs.]

I. The authors conclude that the important causal organism of actinomycosis of bony tissues of cattle is the micro-aerophilic, Gram-positive organism first cultivated by WOLFF and ISRAEL (*Actinomyces bovis*). The aerobic organism isolated by BOSTRÖEM normally lives a saprophytic existence, but can infect man and other animals. It is advocated that the Wolff-Israel organism should be classified in the genus *Corynebacterium*. [Definite criteria, to rule the classification of bacteria, cannot at present be laid down. Consequently it becomes a matter of opinion as to what characteristics are to be considered of the greatest importance for classification purposes. The genus *Corynebacterium* is very ill-defined, ranging from the biochemically active and highly toxic *Corynebact. diphtheriae* to the biochemically inactive and atoxic *C. hofmanni*, and it is easy to find good reasons for including the Wolff-Israel organism in so extensive a group. The fact that this organism produces typical club colonies when growing in a susceptible host is, however, a strong argument in favour of retaining it in the genus *Actinomyces*, at any rate until our knowledge of the two genera (particularly as regard to antigenic structure) is more complete.]

II. This article reviews some investigations which have led to our present knowledge of actinomycosis. This condition, in bony tissues of cattle and in the mammary glands of pigs, is caused by *Actinomyces bovis* (Wolff and Israel). Actinomycosis of soft tissues of bovines is usually caused by *Actinobacillus lignieresi*, whilst granulomatous lesions can also be produced by staphylococci. The inclusion of the Wolff-Israel organism in the genus *Corynebacterium* is advocated.

III. In the first case the affected quarters showed signs of active mastitis and produced typical mastitis secretion, containing numerous staphylococci, streptococci and leucocytes. The udder was amputated, and subsequent examination showed a predominance of endothelial granulation tissue surrounding rosette-like bodies with radiating clubs. In the second case an organism resembling *Actinomyces bovis* was cultured, but club colonies could not be demonstrated in section. In neither case is the author satisfied that *A. bovis* was the causal organism. It is considered that a staphylococcus may have caused the condition.

—E. J. PULLINGER.

DISEASES CAUSED BY PROTOZOAN PARASITES.

REES, C. W. (1934). **Characteristics of the Piroplasms Babesia argentina and B. bigemina in the United States.**—*J. agric. Res.* **48.** 427-438. 3 figs., 1 table. [19 refs.]

This paper records investigations carried out at Jeanerette, Louisiana, to ascertain whether *B. argentina* occurs in the United States of America and whether the species can be considered valid. Strains of *B. argentina* and *B. bigemina* from the Argentine were compared with strains of similar parasites from U.S.A. and with specimens of *B. berbera* and *B. bovis* from Algiers and Germany. The author considers that SMITH and KILBORNE were dealing with a mixed infection of *B. bigemina* and *B. argentina* which can be distinguished morphologically by the smaller size of the latter and the difference in the mean angle of divergence of a pair of organisms which is under 60° in the former and usually over 100° in the latter. Though the range of variation of the angle of divergence was the same in all four organisms, yet the mean was considerably narrower in the case of *B. bigemina*, and widest in the case of *B. bovis*. *B. argentina* occurs only scantily in the peripheral blood, and in this situation affected corpuscles tend to collect into groups. In the internal organs, capillaries may be congested with infected erythrocytes, a condition not seen in *B. bigemina* infection. *B. bigemina* infection yields to treatment with trypan blue, which appears not to affect *B. argentina*. *B. argentina* was cultivated for 96 hours by the method of Bass and Johns, but *B. bigemina* could not be cultivated and disappeared from the culture tubes in 36 hours.

The author could see no significant difference between *B. argentina* and *B. berbera*, but *B. bovis* could be distinguished from both by its minute size and by its marginal position in the erythrocyte.—U. F. RICHARDSON.

ACHAR, S. D., & SRIKANTIAH, G. N. (1934). **A Note on 'Babesia motasi', Wenyon (1926) in Sheep in Mysore State.**—*Ind. vet. J.* **10.** 270-272. 7 figs. on 1 plate, 2 charts. [5 refs.]

The authors found a large piroplasm, which they assumed to be *B. motasi*, in the blood of two sheep which were being used in an experiment on goat-adapted rinderpest virus.

The piroplasm was passaged by blood inoculations to other sheep, but was not seen in goats, cattle, rabbits or buffalo calves similarly inoculated.

This is said to be the first report of the occurrence of *B. motasi* in Mysore. —J. E.

EATON, P. (1934). *Piroplasma canis* **in Florida.**—*J. Parasit.* **20.** 312-313.

A description of the finding of *P.* [*Babesia*] *canis* in association with *Dirofilaria immitis* in the blood of a dog in Florida. Both parasites disappeared after dosage with an organic antimony preparation.—J. E.

I. KOMAROV, A. (1934). **On the Recovery of** *Egyptianella pullorum* **Carpano from Wild** *Argas persicus* **Oken.**—*Trans. R. Soc. trop. Med. Hyg.* **27.** 525-526. [11 refs.]

II. DEBONÉRA, G. (1934). Unicité des agents des spirochétoses des Volailles de Grèce. Relations entre Spirochètes et Aegyptianella. [**Unity of the Spirochaetes occurring in Poultry in Greece. Relationship between Spirochaetes and** *A. pullorum*].—*Rec. Méd. vét.* **110.** 467-471. 3 figs. [14 refs.]

I. Komarov succeeded in isolating and transmitting a strain of *Aegyptianella pullorum* from wild *Argas persicus* ticks. No spirochaetes appeared in the blood of the fowls previously infected with *A. pullorum.* No evidence was found that infection with *A. pullorum* conferred any protection against spirochaetosis and, conversely, birds recovered from spirochaetosis were susceptible to *A. pullorum.*

II. Debonéra proved by cross-immunity tests that there is no relationship between *A. pullorum* and spirochaetes. The mortality caused by spirochaetes is generally heavier in fowls than in geese and ducks, although in some years geese and ducks are heavily affected.

Spirochaetes originating from fowls, ducks and geese are immunologically indistinguishable. They belong to the same species and therefore the use of the terms *Sp. anatis* (duck) and *Sp. anserina* (goose) should be discontinued.

Sp. gallinarum is capable of infecting fowls, ducks, geese and sometimes turkeys.—T. M. DOYLE.

REES, C. W. (1934). **Transmission of Anaplasmosis by Various Species of Ticks.**—*U. S. Dept. Agric. Washington Tech. Bull.* No. 418. pp. 18. 2 figs., 1 table. [22 refs.]

Young chicks, two to ten weeks old, were found useful for the experimental feeding of ticks. Adhesive plaster or elastic bands were used instead of drawstrings for the fixing of various tick-retaining garments to the hosts. Ticks or the progeny of ticks, which had been fed on animals suffering from American piroplasmosis, were used to discover which species transmitted the disease to susceptible cattle. The following species failed to transmit the disease :– *Amblyomma americanum*, *A. cajennense* and *A. maculatum.* Successful non-hereditary transmissions were carried out with *Dermacentor andersoni*, *D. variabilis*, *Ixodes scapularis*, *I. sculptus* and *Rhipicephalus sanguineus.* Hereditary transmission was obtained with *Boophilus annulatus.*—HARVEY S. PURCHASE.

SCHILLING, C. (1933). Immunisierung gegen Trypanosomen-Krankheiten. [**Immunization against Trypanosomiasis**].—*Bull. Soc. Path. exot.* **26.** 1004-1008. [2 refs.] [Orig. in German : French summary].

VAN SACEGHEM, R. (1934). L'immunisation des bovidés contre la trypanosomiase. [**The Immunization of Cattle against Trypanosomiasis**].—*Ibid.* **27.** 170-173. [2 refs.]

CULBERTSON, J. T. (1934). **The Trypanocidal Action of Human Serum : The Relationship Between the Trypanocidal Action of the Serum and Man's**

Immunity to the Trypanosomes Pathogenic for Animals.—*Ann. trop. Med. Parasit.* **28.** 93-97. 1 table. [12 refs.]

The first two papers record attempts to immunize calves and foals to trypanosomiasis by infecting them shortly after birth. Schilling puts forward the theory that the immunity of game in " fly " areas is due to early infection and repeated reinfection. Van Saceghem doubts this theory [as native sheep show an immunity similar to that of game, without the occurrence of constant reinfection], but he expresses the opinion that immunity might be produced by infecting cattle in calfhood, as young animals are, in general, less susceptible than adults to protozoan diseases.

Schilling records the infection of two calves with *Tryp. brucei* and two foals with *T. congolense* and later feeding infected tsetse fly on these animals to maintain their infection and resistance. As a result of this procedure, the foals also contracted a *T. brucei* infection. The health and growth of the animals was not impaired. [Many strains of *T. brucei* have little pathogenicity for cattle and the same appears to apply to *T. congolense* in the horse].

van Saceghem infected four calves, at ages varying from two to 15 days, with *T. congolense*. Two of the calves died but, as the natural mortality of calves is high, he considers that the deaths might have been due to causes other than the trypanosome infection.

The third article records experiments on the action of human serum on *T. lewisi* in view of the fact that human beings are immune to this trypanosome [see JOHNSON, P. D., this *Bull.* **3.** 686]. The sera used proved to have no powers either as prophylactic or curative agents in *T. lewisi* infection of the rat, although the same sera gave evidence of such powers in *T. equiperdum* infection of control rats.

—U. F. RICHARDSON.

DISEASES CAUSED BY VIRUSES.

I. MISSENARD, & ZYLBERTAL. (1934). Quelques observations sur la peste bovine au Soudan. [**A Few Notes on Rinderpest in the Sudan**].—*Rec. Méd. vét. exot.* **7.** 5-9.

II. CURASSON, G., & ZYLBERTAL. (1934). Sur la vaccination intradermique dans la peste bovine. [**Intradermal Vaccination against Rinderpest**].—*Bull. Acad. vét. Fr.* **7.** 265-267. [3 refs.]

I. The authors record certain experiments on the value of anti-rinderpest serum and vaccines in the Sudan. The use of peritoneal washings and virulent spleen pulp for hyperimmunization has been abandoned owing to the difficulty of avoiding abscess formation. Formolized spleen vaccine was found to be equally efficient whether prepared from animals in the early or late stages of the disease. It was effective for immunization after keeping for five weeks, and the immunity produced lasted from five to six months.

Tests on the value of vaccines made from tissues other than the spleen gave unsatisfactory results except for a lung vaccine, which gave sufficient protection against virus injected 13 days later to reduce the disease to a mild febrile reaction.

Attempts to immunize by injecting serum intradermally, followed by the injection of virus into the centre of the serum area, led to the development of normal rinderpest.

The blood of animals in the incubation period was found to contain virus which persisted in the blood up to the time of death.

II. Curasson and Zylbertal record experiments on the immunizing value of

formolized vaccines (spleen and lymphatic gland) inoculated intradermally. By the use of vaccines in this way, immunity could be produced with a quarter of the dose required by the subcutaneous method, and was conferred four days earlier. The most convenient situations for the intradermal inoculation of large (5 c.c.) quantities of fluid were the vulva of the female and the scrotum of the male.

—U. F. RICHARDSON.

VAN SACEGHEM, R. (1934). L'Entérocoque microbe de sortie dans la peste bovine. [**The Enterococcus of Rinderpest**].—*C. R. Soc. Biol. Paris.* **115.** 1749-1751. [3 refs.]

The author theorizes about the true nature of the virus-bacterium association in some of the well-known virus diseases of animals. He wonders why the same organism can be isolated regularly as a secondary invader and whether this fact is any evidence that the organism is in reality a visible phase of the virus. He refers particularly to an enterococcus, which he can always isolate from cases of rinderpest in the Belgian Congo.—J. E.

I. HUPBAUER, A. (1934). Zur Frage der Pluralität des Schweinepestvirus. [**Plurality of the Virus of Swine Fever**].—*Z. InfektKr. Haustiere.* **45.** 294-300. 4 tables. [8 refs.]

II. KÖBE, K., & SCHMIDT, W. (1934). Differentialdiagnose zwischen chronischer Schweinepest und Ferkelgrippe. [**Differential Diagnosis of Chronic Swine Fever and Piglet Influenza**].—*Dtsch. tierärztl. Wschr.* **42.** 145-148 and 163-168. 7 figs., 2 graphs. [6 refs.]

I. After reviewing diseases which are due to a plurality of viruses and the results of research work on the virus of swine fever, Hupbauer carried out cross-immunization experiments to test the question with regard to swine fever. The products used were serum and virus from two institutes in Yugoslavia, one in America, one in the Argentine, and one in Spain. The subject is of importance in the field where simultaneous inoculation methods are employed.

By inoculating animals with serum from one country and virus from another, and noting the results, the author came to the conclusion that a plurality of viruses does not exist for swine fever in the same sense as one finds in foot and mouth disease nor did the strains examined differ in virulence.

II. The first portion of this article is devoted to the several aspects of chronic swine fever. The chronic form plays a subordinate role in the spread of acute swine fever. Diarrhoea is a common symptom and cough is less often encountered. *Post-mortem* findings are chiefly seen in the digestive tract. Concentric buttons occur in the caecum, colon and rectum ; these are due to a mixed infection of *Bact. suipestifer* and virus. All other changes of the mucous membrane of the alimentary tract are non-specific. Petechiae in the kidneys and mucous membrane of the urinary bladder are without significance. Many pathological changes of the organs of the chest and abdomen, and of the skin, are generally wholly uncharacteristic.

After a full consideration of histological methods applied to the brain in chronic swine fever, the authors come to the conclusion that it is not possible on the ground of brain processes alone to make a diagnosis of chronic swine fever. The histological changes in other organs are only of supporting value in the diagnosis of the chronic form.

The second portion of the article is devoted to piglet influenza. This disease is due to a virus, quite distinct from the virus of swine fever, and to secondary bacteria, chiefly *Haemophilus influenzae suis.* Suckling pigs from two to four

weeks old are affected. The epidemiology, clinical picture, *post-mortem* findings, bacteriological results, animal inoculation and histological findings are described from original work. The principal symptoms are cough and unthriftiness. In the absence of secondary invaders, the virus produces a septicaemia with few lesions, but in nature pneumonia was found in 72 cases out of 84. The histological changes in the region of the bronchioles are fully illustrated. In 22 per cent. of affected animals, cellular changes were discovered in the brain.

The authors tabulate the features in differential diagnosis as follows :–

Chronic Swine Fever.	Piglet Influenza.
1. Epidemiology.	
Follows an acute outbreak. Never brought on to premises as such. Animals of all ages attacked.	Attacks only young animals and has an insidious course. It is an enzootic of which transmission from outbreak to outbreak is not yet clear, but is mostly imported by young pigs.
2. Clinical Course.	
Unthriftiness and diarrhoea.	Unthriftiness and coughing.
3. *Post-mortem* findings.	
Gastro-enteritis in different degrees ; seldom the characteristic changes of acute swine fever.	Catarrhal broncho - pneumonia and marked tumifaction of the lymphatic glands.
4. Bacteriology.	
Bacteria of different species in local or septicaemic distribution.	*Haemophilus influenzae suis* and streptococci in the lungs of animals up to 12 weeks old ; later "*B.*" *bipolare.*
5. Animal Inoculation.	
Subcutaneous or intranasal infection with extract from all organs gives rise to acute swine fever. Seldom negative and seldom has to be repeated.	Nasal application of 10 c.c. of lung material causes the clinical picture of piglet influenza with broncho-pneumonia in two to six-weeks-old piglets. The injection of a germ-free filtrate from diseased lungs produces pig influenza without lung changes.
6. Histological Methods.	
Only of limited value. Characteristic changes often absent. Only the whole histological findings allow a safe diagnosis. Besides the brain lesions, there are vascular changes in various organs, lymphatic glands, spleen, kidney, liver.	Specific histological changes absent. Also the regular broncho-pneumonia is not characteristic.

—A. W. N. Pillers.

Hofferber, O. (1934). Ein erfolgreicher Versuch zur Bekämpfung der Ferkelgrippe. [**Successful Control of Swine Influenza**].—*Berl. tierärztl. Wschr.* **50.** 452-454.

The author describes an outbreak of swine influenza, extending over two years, diagnosed by the research institute on the Isle of Riems. During the second year the litters appearing after a certain date, when the older litters were suffering losses, were given a preparation containing vitamins A and D, but the general mode of management and feeding was not altered. These younger litters remained free from swine influenza and grew at the rate usual for healthy pigs.

The author describes this work as an example of the use of non-specific treatment as a preventive of infectious disease.—J. E.

TURNER, A. W. (1933). **The Microphotography of the Living Virus of Pleuro-Pneumonia of Cattle.**—*J. Coun. sci. indust. Res. Aust.* **6.** 299-300. 2 figs. on 1 plate.

This is a brief note introducing and explaining what are claimed to be the first satisfactory photographs of the causal organism, or "virus," of pleuro-pneumonia of cattle. Interest in the morphology of this organism followed on the introduction of a new culture medium, known as "filtered V.F.-ox serum," which gives heavy growths overnight. The cultures were studied by dark ground illumination. Owing to the small amount of light passing through the camera with this method of illumination, some difficulty was at first encountered in obtaining photographs. These difficulties were eventually overcome by using a Leica camera and Agfa superpanchromatic film. The results obtained with this technique were very satisfactory, and two photographs are published.

The organism typically produces a branched mycelium, which may exceed 100μ in length. The mycelia fragment into cocci about $0{\cdot}2\mu$ in diameter, and it is to these forms that the organism owes its property of filtrability. A more detailed article will be published later.—W. I. B. BEVERIDGE.

GMINDER, A. (1934). Versuche über die Immunisierung gegen die infektiöse Gehirnrückenmarksentzündung (Bornasche Krankheit oder Kopfkrankheit) der Pferde in Württemberg. [**Immunization against Borna Disease in Wurttemberg**].—*Berl. tierärztl. Wschr.* **50.** 203-205. 1 fig. [2 refs.]

Borna disease has been known in Wurttemberg for over 100 years and causes considerable loss. It was made notifiable in 1922 and in the following decade 4,300 cases were observed. Gminder describes attempts in the past to immunize horses against Borna disease and gives the results of large-scale vaccination carried out between the winters of 1929 and 1930. Four thousand horses were vaccinated and, as a result, the percentage of clinical cases among the horses in the province fell from 3·7 in 1929 to 1·26 in 1930. The vaccine first used consisted of a filtrate of the cerebrum of horses killed when affected with Borna disease. This did not appear potent enough, so trials with a brain suspension were carried out; the results were favourable and are to be applied on a wider scale in the future.—J. E.

HOWITT, Beatrice F., & MEYER, K. F. (1934). **Tests for Cross-Immunity Between the Virus of Borna Disease and that of Equine Encephalomyelitis.**—*J. infect. Dis.* **54.** 364-367. 2 tables. [7 refs.]

Rabbits and guinea pigs immune to encephalomyelitis developed Borna disease after intracerebral inoculation of Borna disease virus, but no reverse tests were performed. The authors also carried out some virus neutralization tests *in vitro* with rather indefinite results. On the basis of this incomplete experiment, they hold the opinion that the two diseases are immunologically distinct.—J. E.

MOSLEY, H. S., HEANE, C. W., & SHIRLAW, J. F. (1934). **Incidence of Equine Encephalomyelitis in an Indian Cavalry Regiment. History of the Outbreak. Clinical Observations, Treatment and Experiments in the Field etc. Pathological Investigation.**—*J. R. Army vet. Cps.* **5.** 159-172. 1 fig. [Reprinted *verbatim* in *Ind. J. vet. Sci.* **4.** 193-217].

Mosley describes the movements of the regiment, which was on its way to a new garrison post, when this disease broke out. Although two regiments crossed

en route, only one became affected and 71 cases occurred between 17th November, 1933, and 18th January, 1934. The mortality was 21 (20·5 per cent.). This outbreak was regarded, and is described by Mosley, as an example of a tiresome equine disease of India, " paraplegia, kumri or Muttra paralysis." The symptoms were paralytic in character and not primarily indicative of encephalitis.

Heane was sent to investigate the disease on the 23rd November. He contributes the second section of this article. Cases varying from slight weakness of the hind limbs (rarely the forelimbs) to complete paralysis were observed. Hyperaesthesia was present during the first day or two of illness ; the pulse was sluggish and feeble ; there was incontinence of urine, but retention in severe cases. One case only developed cranial symptoms, which resembled a seizure with recovery after 10 to 15 minutes. If the horses were left unsupported, they usually died, but if placed in stocks and supported in slings and forcibly exercised, if at all able to walk with support, they usually recovered. Survival over the 36th hour of visible illness was a favourable prognostic sign. Treatment with various drugs either failed to produce any result or was unassessable. Recovery took from three weeks to two months.

The *post-mortem* macroscopic lesions are given as mild gastro-enteritis occurring in patches, cystitis, an enlarged spleen and congestion of the blood vessels of the cortex of the brain.

A few attempts to elucidate the cause and mode of spread of the disease were made, but no useful result was obtained. A healthy horse was inoculated intrathecally with cerebrospinal fluid from an affected horse and remained well ; a healthy horse was placed alongside a sick horse in slings and was fed from a common bucket, but remained well.

It was found, by the routine taking of temperatures, that fever occurred for a few days before symptoms appeared. This was observed in ten horses, six of which later became affected.

Unfortunately, the investigation remained unfinished owing to the cessation of the outbreak.

Shirlaw made the pathological investigation and describes the changes he found as follows :–

" Subacute inflammation of the vessels of the meninges without any exudation, accompanied by perivascular infiltration and frequent haemorrhage. Punctate haemorrhages are frequent in the brain substance, and a typical diffuse mononuclear infiltration of the neuroglia with destruction of the nerve elements is seen.

" Similar lesions are present in the spinal cord. Joest-Degen bodies are not found. Haemorrhages occur throughout the parenchymatous organs in the majority of cases, and there may be slight degeneration of the cells of these organs. The lymph glands are occasionally swollen and haemorrhagic. Gastro-intestinal catarrh is noted in a few cases. The bladder contains a thick syrupy urine which is frequently blood-tinged, while the submucosa is studded with haemorrhages. Secondary infection of the bladder consequent on urinary stasis is not uncommon, the end result being, in protracted cases, a thickening of the wall of the bladder by a slow infiltration of granulomatous tissue.

" The *post-mortem* appearances presented are parallel to those encountered in American outbreaks caused, probably, by a virus the Moussu-Marchand type."

In addition, he discusses the literature of encephalomyelitis, Borna disease and forage poisoning and concludes that this outbreak in India was probably caused by a neurotropic filtrable virus of organotropic type. He was also able to transmit the disease to a healthy horse, after an incubation period of 19 days, by the intrathecal injection of brain suspension from a case of the disease.—J. E.

KELSER, R. A. (1934). **Equine Encephalomyelitis.**—*Vet. Alum. Quart.* **22.** 45-51. [2 refs.]

A general account delivered as a lecture at Ohio State University. Kelser believes this virus infection to be mosquito-transmitted.—J. E.

I. JÁRMAI, K. (1934). Ueber die durch ein filtrierbares Virus verursachte Magen- und Darmentzündung der Katzen. [**Gastro-Enteritis in Cats caused by a Filtrable Virus**].—*Dtsch. tierärztl. Wschr.* **42.** 401-403. [6 refs.]

II. JÁRMAI, K. (1934). A macskák filtrálható virus okozta gyomor- és bélgyulladásáról. [**Infectious Gastro-Enteritis of Cats caused by a Virus**].—*Allatorv. Lapok.* **57.** 43-45. [4 refs.]

III. LOMBARD, C. (1934). Contribution à l'étude anatomo-pathologique de la gastro-entérite infectieuse des Chats. [**Pathological Study of Gastro-Enteritis of Cats**].—*Rev. vét. Toulouse.* **86.** 268-270.

IV. LEASURE, E. E., LIENHARDT, H. F., & TABERNER, F. R. (1934). **Feline Infectious Enteritis.**—*N. Amer. Vet.* **15.** No. 7. 30-44. 4 figs., 6 charts. [16 refs.]

I. Infectious feline gastro-enteritis is not uncommon in Budapest, and occasionally causes great losses among the young cats of a district. The author investigated one case and procured a filtrate from the liver, spleen and blood of a cat that had died of the disease, and succeeded in reproducing it in three successive passages in young cats. A sample of the filtrate was still potent after 40 days in 50 per cent. glycerine at freezing-point temperature.

The only lesion of this disease is an acute enteritis of the small intestine with involvement of the stomach in some cases.

Reports, by English and French authors, of a similar disease are also referred to.

II. This is almost a *verbatim* version of I.

III. The author records his observations on infectious gastro-enteritis of cats at Toulouse. Twenty-two cases were seen, 11 each in males and females, the males varying in age between three months to two years and the females between three months and one year.

In 21 cats signs of active pulmonary congestion were present, and Lombard considers that lung changes have been overlooked by most investigators of this disease, but he is in agreement with them as to the nature of the lesions of the small intestine.

IV. After brief references to other workers, the authors describe their experiments on 58 cats.

AETIOLOGY.—A filtrable virus was regularly obtained from various organs of natural cases, and was successfully passaged through ten generations in seven months. The virus is present in the stomach and small intestine and their contents, liver, spleen, kidneys, brain, spinal cord, lymph glands and blood.

The disease is transmissible by contact or indirectly by virus-contaminated litter, and the natural incubation period is six to 14 days.

Various bacteria were isolated and applied experimentally to healthy cats, but the results were negative.

SYMPTOMS.—The authors describe constant and general (irregular) symptoms. Infected cats always show a high temperature with a characteristic course [see charts in orig.], the average maximum being 106°F., which was reached between the fifth and eighth days after artificial infection ; death usually occurred within two days of this point. Cats surviving beyond the ninth day of infection invariably recovered. Other constant symptoms include anorexia, a rough coat, great depression and rapid emaciation. General symptoms include diarrhoea or dysentery (70 per cent. of cases), vomition (30 per cent.), unsteady gait, ocular and nasal discharge, a tender abdomen and a tendency to crouch flat, with the head resting on the ground.

PATHOLOGY.—The stomach shows catarrhal inflammation: haemorrhage is rare. The mucosa of the small intestine shows all grades of change, varying between congestion and pseudo-membraneous enteritis. Nearly all the cases observed by the author were infested with hookworms and several also with roundworms. The liver, spleen and kidneys are congested, the bladder sometimes shows petechiae internally and the heart shows muscular degeneration in all cases. The microscopic appearance of these lesions is described.

SPECIES SUSCEPTIBILITY.—Puppies, rabbits, guinea pigs, white rats and pigeons all resisted artificial infection by various methods.

IMMUNITY.—Many cats, under six months and over two years of age, were found to be immune to artificial infection; this was considered to be due to acquired immunity after natural infection.

The virus remained virulent for as long as 91 days, either at room or ice-box temperature (50° to 85°F. and 42°F. respectively), and virus in 50 per cent. glycerine was still potent after 38 days.

Numerous tests were made with a formalinized organ vaccine and with immune serum prepared from cats and mules in combination with virus (simultaneous method); satisfactory results were obtained with each method.—J. E.

ZIEGLER, M. (1933). Ueber Bornasche Krankheit, Katarrhalfieber und Schafenzephalitis im Freistaat Sachsen. [**Borna Disease, Malignant Bovine Catarrh and Ovine Encephalitis in Saxony**].—*Berl. tierärztl. Wschr.* **49.** 757-762 and 773-778. 9 figs., 5 tables. [22 refs.]

Ziegler here publishes a wealth of statistical information on the incidence of Borna disease, bovine malignant catarrh and ovine encephalitis in the various parts of Saxony during the last 40 years, with the object of finding out whether there exists any epidemiological connection between these diseases. There appeared to be none.

Borna disease is enzootic in Saxony, but its incidence shows a bi-annual rise and fall.

The connection between sheep and bovine malignant catarrh was established according to the observations of some veterinary practitioners in Saxony.—J. E.

I. WAGNER, A. (1933). Verordnung über die ansteckende Blutarmut der Pferde. [**Order on Equine Infectious Anaemia (Germany)**].—*Münch. tierärztl. Wschr.* **84.** 600-602.

II. DOBBERSTEIN, J., & WILMES, H. (1934). Die Herzveränderungen bei der infektiösen Anämie des Pferdes. [**Heart Changes in Equine Infectious Anaemia**].—*Berl. tierärztl. Wschr.* **50.** 161-165. 5 figs. [24 refs.]

III. SCHERMER, S. (1934). Ueber den Wert der Blutuntersuchung bei der infektiösen Anämie. [**The Value of Blood Examination in Equine Infectious Anaemia**].—*Ibid.* 165-167. 2 tables.

I. The various aspects of this disease, which has recently been brought under state control, are described. Provision is made for the immediate notification of a suspected case to the local police authorities, who inform their veterinary officer. Power is given to restrict movement, to trace in-contact animals, to instigate an investigation by means of blood examination in order to ascertain the presence of further cases, and to enforce disinfection of premises and the correct disposal of manure. The latter must be packed firmly and left for at least four weeks and not spread on grazing land. The flesh from slaughtered animals is condemned as unfit for consumption.

II. The increase in the pulse rate which occurs during an attack of infectious anaemia is not the direct result of alterations in the constituents of the blood, but is due to pathological changes in the heart. Support for this opinion is to be found in the reports of a number of commissions which have investigated this disease. On *post-mortem* examination, the heart was found to be flabby, dilated and to contain very little blood. The heart muscle was paler than normal and petechiae were present under the epicardium and endocardium.

The authors examined hearts from 18 authentic cases of infectious anaemia and described in detail the macroscopic and microscopic appearances which they found. To the naked eye there were no abnormalities which were constant through the series, though the musculature appeared thickened and inelastic. There were whitish streaks on the epicardium and the muscle trabeculae appeared thickened. Microscopically, a marked infiltration of lymphocytic cells could be seen. This occurred more commonly along the line of the intramuscular connective tissue. The origin and morphology of these cell aggregations is discussed at length. The authors point out that the changes which occur in the heart are diagnostic in themselves and in this respect are of greater value than those which occur in the spleen and kidneys, which may be absent in the intervals between attacks of fever.

III. The results of Schermer's investigations are shown clearly in two series of graphs. He observed the temperature, sedimentation rate and colour index of the blood and carried out general leucocytic and lymphocytic counts and globulin estimations on two cases of infectious anaemia during a period of one month. The results so obtained support his contention that such an examination is of considerable value in the diagnosis of the disease during life.—N. S. Barron.

I. Bridré, J., & Boquet, A. (1933). Vingt ans de vaccination anticlaveleuse par virus sensibilisé. [**Twenty Years of Sheep Pox Vaccination by Sensitized Virus**].—*Ann. Inst. Pasteur.* **51.** 761-762. [4 refs.]

II. Kolayli, A. C., Mavridis, N., & Ilhami. (1933). Étude sur le virus de la variole des Chèvres. Vaccination du Mouton et de la Chèvre. [**Vaccination against Sheep and Goat Pox**].—*Rev. Méd. vét.* **109.** 920-932.

III. Angeloff, S. (1934). Impfungen gegen Schafpocken und die Resultate ihrer Anwendung bei der Schafpockenbekämpfung in Bulgarien. [**Vaccination against Sheep Pox in Bulgaria**].—*Berl. tierärztl. Wschr.* **50.** 189-191. 1 fig. [11 refs.]

I. The authors give the statistical returns concerning their sensitized virus prepared in the Pasteur Institute of Algiers between 1913 and 1932. Twenty-five million doses were issued for use in many countries and no case of sheep pox has been observed in vaccinated animals, nor in untreated sheep having contact with vaccinated sheep.

Strains of sheep pox vary in potency and in their capacity to be neutralized by serum, and satisfactory strains, used for a time for vaccine preparation, lose their virulence. Strains in use have, therefore, to be constantly " watched ".

II. The authors performed several experiments with sheep pox and goat pox in sheep and goats. Briefly, their results were as follows :– goats and sheep readily become infected by contact with their own virus only, and sheep placed in contact with cases of goat pox remain healthy ; goat pox is inoculable into goats by the intradermal, intravenous or intraperitoneal routes, but not by the oral route ; if goat pox virus is injected intratracheally into goats they do not sicken but acquire immunity ; goat pox virus inoculated intradermally into sheep causes only a short reaction and immunizes the sheep against sheep pox ; goat pox virus passed through sheep becomes attenuated and can be used for the immunization

of goats ; calves, foals, asses, rabbits and fowls are resistant to goat pox virus ; sheep pox antiserum neutralizes goat pox virus to a lesser degree than goat pox antiserum neutralizes sheep pox virus.

A vaccine against goat pox has been prepared and used with good results on some hundreds of animals. It is composed of the lymph obtained from the lesion caused by inoculating goats subcutaneously with goat pox virus. An antiserum for curative purposes is also described.

III. The incidence of sheep pox in Bulgaria between 1912 and 1932 is given and illustrated by a graph. It increased enormously during the war and was finally eradicated in 1931, but a fresh outbreak, originating in Rumania, occurred in 1932. Up to 1932 the disease was controlled by the segregation of affected flocks and the killing of affected sheep, but in cases where the latter procedure was objectionable, ovinization was practised. Statistics show that by this method four million sheep were treated between 1909 and 1931. In 96 per cent. of cases the result was completely successful ; there was subsequent generalization in 1·9 per cent., failure to " take " in 2·1 per cent. and 0·44 per cent. died.

Angeloff then discusses the attempts of various workers to prepare a killed vaccine and refers to the use of calf lymph and sheep pox lymph passed through goats. These have not proved reliable. During recent years he used the sensitized virus of Bridré and Boquet with good results for prophylactic purposes in flocks living close to sheep in which the disease had been observed. He has also obtained good results with a simultaneous inoculation method (virus and serum not mixed until just before use) and is now experimenting with a dye vaccine.—J. E.

Hoder, F. (1933). Der Gegenwärtige Stand der Bakteriophagenforschung. **[The Present Status of Bacteriophage Research]**.—*Arch. Mikrobiol.* **4.** 589-635. [Copied *verbatim* from *Rev. appl. Mycol.* **13.** 588-589].

The writer enumerates and briefly discusses the principal contributions since 1917, with special reference to those of the last four years, to the literature on the bacteriophage problem under the headings of (1) occurrence, origin, and properties, (2) diagnosis and therapy, and (3) action and nature of the bacteriophage. Considering the material as a whole, it is felt that no decisive conclusion can be reached as to the essential character of the bacteriophage on the basis of present knowledge. However, the complexity of the phenomenon has been amply demonstrated and d'Hérelle's conception of the bacteriophage as a living entity appears scarcely tenable in the light of recent studies.

A five-page bibliography is appended.

INVERTEBRATE VECTORS OF DISEASE.

Roberts, F. H. S. (1934). **Ticks Infesting Domesticated Animals in Queensland.** —*Qd. agric. J.* **41.** 114-123. 22 figs. on 3 plates. [Printed *verbatim* as *Pamph. Anim. Hlth. Sta. Yeerongpilly. Bull.* No. 1. pp. 11].

The author, avoiding unnecessary technical terms, gives an excellent description of the ticks which are met with in Queensland. The drawings are very illustrative of most of the characteristics needed in differentiating the species.

An account of the part played by each specie in the economics of stock raising is given. It is a very useful guide to the recognition and understanding of the more important and commonly found ticks of Queensland.

—Harvey S. Purchase.

JELLISON, W. L. (1934). **The Parasitism of Lizards by** *Ixodes ricinus californicus*. —*J. Parasit.* **20.** 243. [Copied *verbatim* from *Rev. appl. Ent.* **22.** 162-163].

During March and April 1932, numerous collections were made in various localities in California of *Ixodes ricinus californicus*, Banks, which is a serious pest of deer and domestic animals and frequently bites man. Adults were taken in considerable numbers from vegetation and were also found infesting dogs, horses and man. The immature stages were collected only on alligators and lizards, except in one instance when an engorged nymph was taken from a dog. Since lizards are abundant and the ticks were found on them in large numbers, the author considers that they are important hosts, particularly as in one locality where they were numerous, over 250 adults were collected from vegetation in a few hours and no other small animals that might have served as hosts for the immature stages were seen.

NASH, T. A. M. (1934). **Advice on Tsetse Surveys and Clearings.** pp. 8. Kaduna [Nigeria] : Govt. Printer. [Copied *verbatim* from *Rev. appl. Ent.* **22.** 173].

In this brief and popular outline of the subject of tsetse-flies and their control by means of clearings, notes are given on the general appearance of *Glossina morsitans*, Westw., *G. tachinoides*, Westw., *G. palpalis*, R.-D., and *G. longipalpis*, Wied., which are the commonest species in Nigeria, on the habitats of the first three species, on the reason for making fly surveys and the method used, and on the types of clearing necessary under various conditions and the most satisfactory means of carrying out the work required.

I. JACK, R. W. (1934). **Tsetse Fly and Game.**—*Rhod. agric. J.* **31.** 259-294. 1 map. [19 refs.]

II. LEWIS, D. J. (1934). **The Behaviour of the Larvae of Tsetse-Flies before Pupation.**—*Bull. ent. Res.* **25.** 195-199. 1 table, 1 plate. [18 refs.]

I. Experimental work on an extensive scale against *Glossina morsitans* has been carried out in four areas. In all cases the fly was encroaching on to clean areas ; up to 1930 the encroachment was at the rate of 1,000 square miles per year. The game was reduced by systematic hunting between two game fences ten miles apart immediately adjacent to the infested areas. In one case, 600 square miles were reclaimed and in all areas the encroachment was arrested. In face of these experiences, any purely theoretical arguments against controlling tsetse fly by game reduction are not valid, at least as far as the conditions in Southern Rhodesia have been tested.

The bush-pig does not appear to be a suitable source of food for *G. morsitans* as its habit of lying up in thick cover during the day gives the fly little chance to feed on it. Also, for the same reason, the bush-pig is difficult to reduce in numbers by ordinary hunting methods. Baboons and monkeys, although fairly large diurnal feeders, use their hands so effectively that a fly rarely has a chance to take a feed. The disturbance of game by hunting reduces the fly density in an area and tends thus to eradicate the fly. The author is careful to point out that these operations have been game reduction and not eradication ; further, that the experiments are strictly limited in extent and under effective control.

II. Working with the larvae of *G. tachinoides* and *G. submorsitans*, it was found that these burrowed most easily and regularly in coarse sand, or sand with pebbles. They crawled very slowly and often had to traverse hard ground before reaching suitable soil. When searching for a site, or whilst attempting to burrow, the larvae are exposed to the predators and parasites. In the experiments carried

out the larvae often failed to burrow in fine sand (diameter of particles, 0·2 mm. or under) or wood ash (diameter of particles, 1 mm. or under).

—HARVEY S. PURCHASE.

DISEASES CAUSED BY METAZOAN PARASITES.

POWLEY, J. O. (1934). **The Control of Sheep Scab.**—*Vet. Rec.* **14.** 905-910. 7 figs. [5 refs.]

Powley describes the life history of *Psoroptes communis* (var. *ovis*) and methods of controlling scab. Attention is drawn to undocked sheep, as these may not show typical lesions and yet be suffering from a heavy infestation.

—HARVEY S. PURCHASE.

NÖRR, J. (1934). Ein Beitrag zur Demodicosis des Pferdes. [**Demodicosis in the Horse**].—*Tierärztl. Rdsch.* **40.** 217-222. 7 figs. [24 refs.]

In view of the rarity of demodectic mange in the horse, the author has searched the literature and here reviews it, giving one case record in detail.

In the horse the demodex usually causes intense itching in the regions where the harness lies and, as a direct or indirect result of scratching, the affected areas, which are usually small and multiple, become denuded of hair and smooth. The demodex is only to be found in deep scrapings and in small numbers. The author gives an illustration of a parasite from the case he describes : it differs in form from the canine demodex, possessing a much shorter abdomen as well as other points of difference.

The lesions of this case spread rapidly when left untreated for a week and responded fairly promptly to treatment with a sulphur-oil preparation. Attempts to transmit the parasite to another horse and to a dog failed.—J. E.

BUXTON, P. A. (1934). **Separation of Lice from Hair, Wool or Feathers.**—*Proc. R. ent. Soc. Lond.* **9.** 5-6. [Copied *verbatim* from *Rev. appl. Ent.* **22.** 165].

The author describes a method for removing lice from hair, wool or feathers by dissolving these in a solution of 2 per cent. sodium sulphide and 2 per cent. potassium hydroxide in water, which is then filtered. As the lice are transparent and difficult to see, they should be washed off the filter paper with distilled water and stained with eosin (other stains, such as fuchsin and carmine, being destroyed by traces of the reagent that remain in the specimens). The black pigment that is so abundant in black hair and feathers will not pass through a filter paper, but may be removed by shaking the solution in a separating funnel with paraffin oil ; the lice float in the oil, and the black liquid can be drawn off through the cock at the bottom.

EVANS, A. C. (1934). **Studies on the Influence of the Environment on the Sheep Blow Fly** *Lucilia sericata* **Meig. I. The Influence of Humidity and Temperature on the Egg.**—*Parasitology.* **26.** 366-377. 8 figs., 4 tables. [11 refs.]

Evans has studied the effect of climatic variations on the egg of *L. sericata* under laboratory conditions. It was found that, although the eggs of *Lucilia* lost water readily under dry conditions, they would not absorb water if replaced in a saturated atmosphere. The chorion was found to play an important part in controlling the rate at which water was lost in dry air and also the amount lost. Temperature naturally plays an important part in governing the loss of water from

the eggs, though in saturated air a hatch of 100 per cent. occurs over a wide range, namely, from 14° to 35°C. With regard to the importance of the combination of temperature and humidity on the eggs of *Lucilia*, it was found that the important factor controlling mortality was loss of water and not temperature directly, thus, the higher the temperature the more susceptible are the eggs to equal evaporative conditions.—J. S Steward.

Cook, S. S. (1934). **Insect Control.**—*Nav. med. Bull. Wash.* **32.** 229-247. [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 740. Signed by P. A. B.]

The paper gives a condensed account of methods of killing insects, particularly those of importance in relation to medicine. It appears to be a sound and up-to-date piece of work, but it does not lend itself to summarisation. As it is rather short, the value might perhaps have been increased if it had included an annotated list of books and important papers on the subject.

de Jesus, Z. (1934). **Experiments on the Control of the Common Water Leech, *Hirudinaria manillensis*.**—*Philipp. J. Sci.* **53.** 47-65. 2 plates. [14 refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 749. Signed by A. G. B.]

The author conducted experiments in the laboratory with a view to finding a practical way of controlling or exterminating this leech, which feeds on buffaloes and cattle.

The carabao leech, as it is called, is fairly abundant in the Philippines and is found also in Java, Ceylon, Southern India and Siam. It attacks men who work in paddy fields or fish in leech-infested waters. A mature *H. manillensis* can suck 10 to 20 cc. of blood. He found that a 1 in 50,000 solution of copper sulphate killed both young and mature leeches and suggests the broadcasting of this chemical on the water or the dragging of a bundle containing the commercial sulphate through it. If the infested place is limited in area, crude common salt may be broadcast to form a 2 to 3 per cent. solution ; tobacco midribs or an infusion of them may be similarly employed. Waste midribs may be dumped into leech-infested places. Either a 1 : 100 infusion of tobacco or a 5 per cent. solution of common salt should be useful in dislodging leeches which have become attached. Derris is poisonous to leeches as it is to fishes and since it grows in the islands its use should be practical and economical. A duck, *Anas boschas* Linn., was found to consume *H. manillensis*, searching for it in infested pools. [It does not appear that the author tested any of the chemical methods in the field.]

I. Pillers, A. W. N. (1934). **Notes on Parasites in 1933.**—*Vet. Rec.* **14.** 758-760. 1 table.

II. —. (1934). **Report of Committee [U.S. Live Stock Sanit. Ass.] on Parasitic Diseases.**—*J. Amer. vet. med. Ass.* **84.** 543-552. [13 refs.]

I. This is the author's annual report on the identification of parasites of various kinds which have been submitted to him for examination during the past 12 months. No uncommon species were encountered among the 53 species represented, but the occurrence of a penetration of the small intestine of the rabbit by *Cittotaemia pectinata* [the common rabbit tapeworm] is recorded and is of some interest as it had occurred without any visible changes in the peritoneum.

II. The report of this committee consists of a résumé of the principle additions made to the knowledge of parasitology during the 12 months preceding the meeting of the Congress. It is recommended that the work be continued, that the Association publish a check list of the parasites of domestic animals in the United States as furnished by the Zoological Division of the Bureau of Animal

Industry, and that the 1934 Committee on Parasitic Diseases be appointed without delay in order that a survey of parasites of horses, cattle, sheep, swine and poultry in the United States may be prepared before the next Congress.—E. L. TAYLOR.

I. CAMERON, T. W. M. (1934). **The Internal Parasites of Horses : A Survey.** —*Vet. J.* **90.** 43-48.

II. CAMERON, T. W. M. (1934). **The Internal Parasites of Domestic Carnivores : A Survey.**—*Ibid.* 206-213.

I. This is a brief account of the most important and most interesting internal protozoan and metazoan parasites of the horse. As it covers such a wide field it is, however, mainly of interest to the general worker. The occurrence of *Setaria equina* [the common filarial worm] in Great Britain is reported for the first time. The author considers periodical dosing to be one of the best preventive measures against helminthic diseases in horses.

II. This survey covers the most prevalent and most important helminths and protozoa of dogs, cats and foxes, giving interesting points in connection with their life histories, pathogenicity and methods of control. It is pointed out that domestic carnivora are kept in much more intimate contact with human beings than are other animals, and that several of their parasites are transmissible to man. Our knowledge of the bionomics of these parasites is, however, sufficiently adequate in most instances to enable us to formulate effective methods of control. [*Spirocerca sanguinolenta* is mentioned as not occurring in America. This is apparently an oversight as PRICE—(1929). *J. Amer. vet. med. Ass.* **74.** 864.—states that it has been reported nine times in the United States].—E. L. TAYLOR.

I. KAUZAL, G. (1933). **Note on a Trichostrongylus Infestation of Lambs in Victoria.**—*Aust. vet. J.* **9.** 197-198.

II. KAUZAL, G. (1933). **Seasonal Incidence of Gastro-Intestinal Parasites of Fat Sheep in New South Wales.**—*Ibid.* 179-186. 3 tables, 1 chart.

I. The author described an outbreak of black scours in six-month-old lambs. The owner of the flock suspected that the lungworm (*Dictyocaulus filaria*) was responsible for his losses. *Post-mortem* examinations showed very numerous *Trichostrongylus* spp. (35,000 to 83,000) in the duodenum. The number of *D. filaria* present averaged between 50 and 60, one lamb having 200. It is recorded that, in spite of the large numbers of *Trichostrongylus* spp. present, egg counts were relatively low, never exceeding 3,600 eggs per g. of faeces. Subsequent examination of the parasites, however, revealed that a large number were immature. The marked effects of trichostrongylosis were demonstrated by a comparison of weights of infested and uninfested lambs. The former weighed from 35 to 49 lb., and the latter from 58 to 77 lb. Treatment with copper sulphate, pyrethrum extract and carbon tetrachloride was not successful.

II. A survey was conducted to determine within what limits infestation may be met with in so-called " fat " sheep slaughtered at the Sydney abattoir. In addition, changes in seasonal incidence were determined and an attempt was made to ascertain the relative egg-laying properties of the more important species. A total of 495 sheep were examined, parasites present being counted by a sampling method. The survey showed that considerable infestations with *Haemonchus contortus*, *Trichostrongylus* spp., *Ostertagia* spp. and *Nematodirus* spp. may be commonly met with in sheep considered as " fat " stock. Over 14·6 per cent. of all sheep examined were infested with from 100 to 500 *H. contortus*, 13 per cent. with over 2,000 *Nematodirus* spp. and 18 per cent. with over 2,000 *Trichostrongylus* spp. Heavy infestations with *Ostertagia* spp., *Oesophagostomum columbianum* or

Chabertia ovina were seldom met with. Considerable variation of seasonal incidence occurred in the various species, *H. contortus* and *Trichostrongylus* spp. falling from a marked peak in the summer quarter to a low minimum in the winter quarter. On the other hand, infestation with *Ostertagia* spp., *Nematodirus* spp. and *Chabertia ovina* tended to remain more constant throughout the whole year. Egg production of *H. contortus* was found usually to be five to ten times higher than that of *Trichostrongylus* spp. or *Ostertagia* spp., and from fifty to one hundred times as great as that of *Nematodirus* spp. An abstract does not do justice to the large amount of interesting and important data in this paper; the original should be consulted.

Ross, I. C. (1934). **Parasitological and Other Problems in Sheep in Western Australia.**—*J. Sci. & Indust. Res. Australia.* **7.** 1-8.

The cause of difficulty in rearing young sheep satisfactorily in the Midland and Great Southern districts of Western Australia was investigated. This difficulty had been generally attributed to the effects of worm infection, but although infection with small trichostrongyles was found to be prevalent, it is thought that the effects seen are due primarily to malnutrition during the continuously dry summer and autumn, which tends to a great fall in nutritive value of grasses. Worm infestation is of secondary, though very real, importance. Recommendations are made for alterations in existing sheep practice and the earlier supplementary feeding of ewes and young sheep, while the possibility of obviating the effect of parasitism by earlier lambing and weaning are also discussed. The control of the rabbit problem as a serious factor affecting the nutrition of sheep is also recommended.
—I. Clunies Ross.

I. Granouillit. (1933). Résultats d'une enquête en Cochinchine sur la Distomose et l'Amphistomose des bovo-bubalins. [**Fascioliasis and Amphistomiasis of Cattle and Buffaloes in Cochin-China**].—*Rev. vét., Toulouse.* **85.** 502-510. 1 table.

II. Taylor, E. L. (1934): **The Production of Malformed Eggs by Immature** *Fasciola hepatica.*—*Trans. R. Soc. trop. Med. Hyg.* **27.** 499-504. 3 figs. [9 refs.]

I. The author gives an account of returns from abattoirs in five towns in Cochin-China, showing the percentage of livers infested with *F. hepatica* and *Amphistomum explanatum.* Those condemned for heavy infestation with *Fasciola* varied from none to 15·92 per cent., and for heavy infestation with *Amphistomum* from none to 7·8 per cent. *A. explanatum* is thought to cause considerable damage by setting up an inflammation in the gall-bladder.

II. Numerous thick-shelled trematode eggs, bearing a protuberance at one extremity, were found in the gall-bladder of a sheep, and were finally traced to young specimens of *F. hepatica* in the liver, four of which were found to contain these abnormal eggs. It is thought very probable that the production of these eggs is normal in the early stages of the activity of the generative organs of the liver fluke, and it is suggested that the finding of such eggs may be of some clinical value in indicating the period at which infestation has been acquired by an infected animal.

The observation of previous investigators, that the shell substance originates in the vitelline cells, is confirmed.—E. L. Taylor.

Iwanoff, X. (1933). Untersuchungen über die sog. Pentastomen- oder Trematodenknötchen in den Gekröslymphknoten von Rind und Büffel. [**Experiments on the So-Called Pentastomal or Trematode Nodules in the Mesenteric**

Lymph Glands of Cattle and Buffaloes].—*Z. InfektKr. Haustiere.* **45.** 157-190. 7 figs., 2 tables. [18 refs.]

Iwanoff reviews the literature on the subject of parasitic nodules in the mesenteric lymphatic glands of cattle and sheep, and then describes in great detail his own work at Sofia. The main account concerns cattle, but buffaloes receive considerable attention. The morphology, including colour and consistence, is given *in extenso* and explanations are offered for the various differences observed. Under varying conditions the causal larvae may be living or dead. The histological appearances of lesions due to pentastomes and nematodes are figured. Eosinophile infiltration is a marked feature. Green areas, formerly thought to be due to pentastomes, and later associated with trematodes, are due to parasites of both these groups and also to nematode larvae. Brown areas are caused by calcified pentastome larvae and to uncalcified nematodes. Grey areas are due to older changes associated with further resorption.

Details are given of the quantitative examination of 2,910 pentastome areas in cattle, and 1,215 in buffaloes, as to viability, colour, consistence, etc. 195 nematode lesions in cattle and 697 in buffaloes are similarly dealt with.

Of 222 cattle, aged from six months to 16 years, 192 (86·48 per cent.) harboured pentastome larvae, of which 96 (50·5 per cent.) were living. Seventy-eight (35·13 per cent.) cattle showed changes due to larval nematodes. Of 212 buffaloes of similar age limits, 138 (65·09 per cent.) had pentastome lesions and in 36 (26·08 per cent.) the parasites were living. 148 (60·37 per cent.) showed changes due to nematodes.—A. W. N. Pillers.

I. Wetzel, R. (1933). Zum Wirt-Parasitverhältnis des Sangwurmes Echinoparyphium paraulum in der Taube. [**The Host-Parasite Relationship of the Trematode** *Echinoparyphium paraulum* **in the Pigeon**].—*Dtsch. tierärztl. Wschr.* **41.** 772-775. 2 figs. [11 refs.]

II. Ameel, D. J. (1934). **Paragonimus, its Life History and Distribution in North America and its Taxonomy (Trematoda, Troglotrematidae).**—*Amer. J. Hyg.* **19.** 279-317. 101 figs. on 7 plates. [42 refs.]

III. Yenikomshian, H. A., & Berberian, D. A. (1934). **The Occurrence and Distribution of Human Helminthiasis in Syria and the Lebanon, with Case Reports of** *Dicrocelium dendriticum* **and** *Hymenolepis nana* **Infestations.**—*Trans. R. Soc. trop. Med. Hyg.* **27.** 425-435. 1 plate, 5 tables. [3 refs.]

I. An enteritis causing the death of pigeons was found to be associated with a heavy infestation of *Echinoparyphium paraulum* throughout the whole length of the small intestine. Sections of the parasites attached to the intestinal mucosa showed the villi drawn into the ventral and oral suckers, the living epithelium apparently forming the food of the worm. Adult pigeons were observed to make a spontaneous recovery, all the worms being eliminated.

II. The life history of *P. kellicotti* has been carefully worked through in the snail, *Pomatiopsis lapidaria* (first intermediate host), a species of crayfish of the genus *Cambarus* (second intermediate host) and the mink, which is the usual mammalian host. All the stages are described in detail, that of the sporocyst and first generation of rediae being the first published description. The cuticular spines of the adult are thought to be of no value for specific determination, and the only constant difference found between American and European forms was in the size of the gut in the second generation of the rediae. Pending such time as we have conclusive evidence, however, it is considered advisable to recognize *P. westermanii*, *P. ringeri*, *P. kellicotti* and *P. compactus* as distinct species.

III. Some 3,530 faecal specimens were examined, of which 70 per cent.

showed positive evidence of worm infestation. *Trichostrongylus* sp. was observed in seven cases, *Dicrocoelium dendriticum* in 18 and *Fasciola hepatica* in seven.

—E. L. TAYLOR.

I. RAO, M. A. N. (1934). **A Comparative Study of** *Schistosoma spindalis* **Montgomery, 1906 and** *Schistosoma nasalis* **n.sp.**—*Indian J. vet. Sci.* **4.** 1-28. 5 figs., 5 plates, 2 tables. [26 refs.]

II. —. (1934). **Bovine Nasal Schistosomiasis.**—*Indian vet. J.* **11.** 1-4.

III. DORAISWAMY, K. P. (1934). **Nasal Granuloma or Nasal Schistosomiasis in Cattle.**—*Ibid.* 25-32.

IV. IYENGAR, B. D. (1934). **Some Observations in the Treatment of Bovine Nasal Granuloma.**—*Ibid.* 37-41. 1 table.

I. Rao has made a careful comparison between *Schistosoma spindalis* and the schistosome which is responsible for nasal granuloma in bovines, and which he previously described as a new species and named *S. nasalis*. He has compared the shape of the egg, the morphology of the miracidia and cercariae, the morphology of the adults, their habitat and their choice of intermediate host. An effort to produce nasal schistosomiasis by infection with the cercariae of *S. spindalis* failed. Evidence was also obtained of the nasal schistosome infecting the lung, which *S. spindalis* is not known to do, and he concludes that the nasal parasite belongs to a species quite distinct from *S. spindalis*.

II. This editorial article gives a brief history of the discovery of the cause of bovine nasal granuloma in India. The efficiency of tartar emetic as a curative agent, and of copper sulphate for the destruction of the intermediate hosts, is considered to be such that proper organisation might banish the disease within the next decade.

III. This paper gives a general account of the symptoms, diagnosis, treatment, prevention and spread of bovine nasal schistosomiasis.

IV. Intravenous injections of tartar emetic were tried in 22 cases of bovine nasal schistosomiasis, the dose used in most instances being 2·5 c.c. of a 3 per cent. solution per 100 lb. body weight. Results on the whole were very satisfactory, but considerable local irritation and gastro-intestinal disturbances were often produced, suggesting that the solution was too concentrated and the dose too large.—E. L. TAYLOR.

I. RAO, M. A. N. (1933). **A Preliminary Report on the Successful Infection with Nasal Schistosomiasis in Experimental Calves.**—*Indian J. vet. Sci.* **3.** 160-162.

II. MAHAJAN, M. R. (1933). **Bovine Nasal Granuloma (Snoring Disease of Cattle) in Hyderabad State.**—*Ibid.* 346-349. 2 figs. on 1 plate, 1 map. [1 ref.]

I. The water snails, *Planorbis exustus* and *Limnaea leuteola*, collected in an area where nasal granuloma is endemic, were found to contain the cercaria of *Schistosoma spindalis* and *Cercariae indicae XXX*. An attempt was made to infect three calves with *C. indicae XXX*, one by applying the cercariae to the mucous membrane of the nose, one by drenching the calf with water containing the cercariae, and one by both methods. In the course of a few weeks, symptoms of nasal granuloma began to appear and the eggs resembling those found in nasal schistosomiasis were found three months after the first application of larvae. Up to the time of writing, eggs had not appeared in the calf which had been drenched with cercariae, but discharge from the nostril was present.

II. An account is given of the finding of bovine nasal granuloma in Hyderabad

State, and of goats harbouring *S. spindalis*, the schistosome which is now associated, by several authorities, with that disease of cattle.—E. L. TAYLOR.

CHEN, H. T. (1934). **Reactions of** *Ctenocephalides felis* **to** *Dipylidium caninum*. —*Z. Parasitenk.* **6.** 603-637. 31 figs., 1 plate. [3 pp. refs.] [Copied *verbatim* from *Rev. appl. Ent.* **22.** 166].

The following is taken from the author's summary: The literature on immunity from infection in insects is reviewed. Little is known concerning insect reactions to helminth infections. A résumé is given of the life-history of fleas in general and of the tapeworm, *Dipylidium caninum*. In the author's investigations, in which almost all the fleas used were *Ctenocephalides felis*, Bch., the tapeworm embryos hatched in the ventriculus of the flea larva and immediately began to migrate through the intestinal epithelium into the body cavity. The growth of the cysticercoids was slow during the larval stage of the flea, but they increased rapidly in size in the pupa and adult. Although all larvae appeared equally voracious when given an infective meal, the heaviest infections occurred among those of the later instars, owing to a larger mouth-cavity permitting the ingestion of more tapeworm eggs and egg pockets. Over 35 per cent. of the infested larvae died in 24-48 hours after infection. A second period of marked mortality occurred immediately before pupation and a third during the pupal stage.

The literature on the blood cells of insects is reviewed, and the blood elements of fleas are studied and classified. All three types of leucocytes recognised in flea blood, pre-amoebocytes, amoebocytes and macrocytes, respond in the reaction to the tapeworms. A diagrammatic chronological representation of what occurs in infected fleas is given.

I. MARTIN, C. J., & ROSS, I. C. (1934). **A Minimal Computation of the Amount of Blood removed daily by** *Haemonchus contortus*.—*J. Helminth.* **12.** 137-142. 5 tables. [13 refs.]

II. HALL, M. C. (1934). **Fighting Haemonchus.**—*N. Amer. Vet.* **15.** No. 8. 42-48. 1 fig.

I. An attempt was made to obtain some indication of the quantity of blood withdrawn by *H. contortus* from the amount of phosphorus which leaves the sheep within the eggs of the worm. The average phosphorus content of the eggs was found to be 0·57 mg. per 10^6 eggs: the daily egg production per female averages about 5,000 eggs per day: a naturally infected sheep often carries 4,000 worms, of which 2,000 would be females, and 29 c.c. of blood would be required to produce the 5·7 mg. of phosphorus in the eggs which would be passed. Since this is a minimal figure and the parasites are probably very wasteful in their use of the blood, it is probable that the actual amount withdrawn is much higher, and is sufficient to account for the anaemia of haemonchosis, without assuming any additional action of toxic secretions or products of the parasites' metabolism.

II. The author gives, in military terminology, a full and interesting account of haemonchosis and its control, comparing the various aspects of the problem to those of a military campaign. Mention is made of trials which are being carried out with tall forage crops for grazing purposes, in order to ascertain whether the intake of infective larvae will thereby be sufficiently diminished to prevent the development of disease.—E. L. TAYLOR.

I. PARNELL, I. W. (1934). **Studies on the Bionomics and Control of the Bursate Nematodes of Horses and Sheep. I. The Effect of Urine on the Eggs and Larvae in the Feces.**—*Canad. J. Res.* **10.** 532-538. 3 tables. [9 refs.]

II. ENIGK, K. (1934). Die Widerstandsfähigkeit der Entwicklungsstadien der Strongyliden ausserhalb des Wirtstieres. [**The Viability of the Developmental Stages of Strongyles outside the Host**].—*Arch. wiss. prakt. Tierheilk.* **67.** 363-376. 1 table. [43 refs.]

I. Fresh faeces and faeces which had been incubated for one, two, three and four days were placed in various concentrations of fresh and stale urine of the horse and cow, the observations being controlled by similar samples of faeces placed in water. It was found that urine had a marked lethal effect upon the eggs and larvae, even when diluted with three parts of water. Attempts are being made to adapt this method of destroying infection to the control of bursate nematodes under actual farming conditions.

II. The author reviews the literature on the reactions of the larvae of equine strongyles and gives an account of his observations, among which the following may be cited as of particular interest.

About 0·1 per cent. of the larvae of *Trichonema* spp., which had been kept in a dry state on a glass slide, were found to have remained viable after four and a quarter years. The lethal effect of several different disinfectant substances and artificial manures was tried but calcium nitrate was the only artificial manure which gave any promise of exerting an action when used on the land, a solution of 0·5 to 1 per cent. copper sulphate proved, however, to be more effective. The fresh urine of horses or cattle was found to kill the larvae in from 15 to 48 hours, two to three-weeks-old urine in two and a half hours, but tankage was much less effective. Cow's urine was also found to be less potent than horse's urine for killing the larvae. It is recommended that manure should be well packed in order to ensure a heating up to 70°C. The addition of disinfectants in the manure is regarded as impracticable for the destruction of infective material ; it is suggested that the walls of the stable should be painted with carbolineum to the height of one and a half yards, to prevent capilarity in whitewashed walls and the ascent of larvae.—E. L. TAYLOR.

I. GORDON, H. McL. (1933). **A Note on the Presence of the Lungworm of the Cat,** *Aelurostrongylus abstrusus* **(Railliet, 1898), in Australia.**—*Aust. vet. J.* **9.** 198.

II. GORDON, H. McL., & GRAHAM, N. P. H. (1933). **A Few Cases of Infestation with** *Chabertia ovina*.—*Ibid.* 198-199.

I. The author records the presence of this parasite for the first time in Australia.

II. A number of naturally infested sheep were examined *post mortem* with special reference to the helminth parasites present. The sheep in question were suffering severely from mixed infestations with *Trichostrongylus* spp., *Ostertagia* spp., *Nematodirus* spp., *Trichuris ovis*, *Dictyocaulus filaria*, *Moniezia* spp., *Müllerius capillaris* and *Chabertia ovina*. *Trichostrongylus* spp. were the chief cause of the poor condition but other parasites, notably *C. ovina*, were also causing pathogenic effects. In view of recent work by CLUNIES ROSS and KAUZAL [unpublished but presented at the Australian Veterinary Association Annual Conference, Canberra, 1933] on *C. ovina*, special attention was directed to this parasite. The number present in eight cases examined varied from four to 330, the average being over 100. The parasites, by their feeding activities, produce a haemorrhagic colitis with oedema of the mucosa and great thickening of the intestinal wall. It is probable that these changes lead to interference with absorption processes. Faeces passed are soft and pultaceous, characteristically containing blood and mucus. The parasites attach firmly to the mucosa, often requiring considerable traction

with forceps to effect their removal. A number of the parasites appeared to have their intestines filled with blood. Ingested blood apparently soon changes, giving the parasites' intestinal contents a greyish colour. Even a few (four or five) parasites can cause considerable damage to the mucosa. In a four-month-old lamb, 330 *C. ovina* were present and the mucosa of the colon had suffered very severe damage. This infestation had been picked up during winter months, indicating the resistance of the larvae of this species to cold climatic conditions.

I. FAUST, E. C. (1932). **The Development of Strongyloides in the Experimental Host.**—*J. Parasit.* **19.** 167.

II. LAPAGE, G. (1933). **Cultivation of Parasitic Nematodes.**—*Nature.* **131.** 583-584. [2 refs.]

I. The stages following the infection of a susceptible animal may be divided into :- (1) the pre-patent period ; (2) the patent period, during which the females are laying eggs, and (3) the post-patent period, when the mature females are still present, but have passed the stage of egg production.

II. In this letter the author gives a concise account of the method which he has developed for the cultivation of the larvae of trichostrongyloid nematodes and obtaining bacteriologically sterile exsheathed third stage larvae. His method is based upon one first used by McCOY [(1929). *Science.* **69.** 74-75.] but he uses a particular strain of *Bact. coli* originally obtained from the intestines of the parasitic stages of the larvae. On being placed in a 1 : 20 dilution of " milton " the infected larvae exsheath in about 20 minutes. The bacteria are killed by this strength of " milton " but the larvae remain alive for three or four days.

More than 200 media have been tried in an endeavour to cultivate these larvae to a further stage of development, but without success.—E. L. TAYLOR.

I. SCHULZ. (1933). Zur Diagnostik und Statistik der Ascariasis bei Hunden. **[Diagnosis and Statistics of Canine Ascariasis].**—*Tierärztl. Rdsch.* **39.** 779. 1 table. [2 refs.]

II. MAROTEL. (1933). Déchirures et perforations ascaridiennes de l'intestin. **[Perforations and Ruptures of the Intestinal Wall by Ascarids].**—*Rev. vét., Toulouse.* **85.** 657-668. 1 fig. [1 ref.]

I. A sample of faeces is taken from the rectum, a portion as large as a linseed is mixed with a drop of water on a slide and a thick coverslip applied which is moved up and down until the faeces and water are mixed, and the film is thin enough for examination under the microscope by a magnification of 75 diameters. Of 942 dogs examined 13·9 per cent. were found infected, 45·5 per cent. of dogs less than three months old, and 1·7 per cent. of dogs two to three years old.

II. The damage caused by ascarids is " ordinary ", such as chronic intestinal catarrh, emaciation and progressive anaemia, or " exceptional ", such as obstruction of bile duct and intestine, and perforation of the intestine. It is stated that some 30 instances of perforation have been reported during the last 100 years and the author is of the opinion that this accident cannot occur in more than 1 out of 1,000 cases of ascariasis. He proceeds to consider the possible way in which this perforation can be brought about and concludes that two out of three are rents in the wall of the intestine resulting from obstruction caused by a bunching of the worms in one part, and that the remainder are due to the worms perforating the intestinal wall at some weak spot where there may have been a minute ulcer or other lesion of the mucus membrane.—E. L. TAYLOR.

I. CLAPHAM, P. A. (1934). **Ascariasis and Vitamin A Deficiency in Pigs.**—*J. Helminth.* **12.** 165-176. 9 graphs. [10 refs.]

II. McCOY, O. R. (1934). **The Effect of Vitamin A Deficiency on the Resistance of Rats to Infection with** *Trichinella spiralis.*—*Amer. J. Hyg.* **20.** 169-180. 4 tables. [10 refs.]

I. Observations were made on the progress of an ascaris infestation in two infected sows from the same litter, one of which was fed on a vitamin A deficient diet ; later observations were made on two groups of four young pigs, one of the groups receiving a vitamin A deficient diet. In the latter experiment infective ascaris eggs were given to the pigs as soon as symptoms of avitaminosis appeared. It was not found possible, however, to correlate the duration or the severity of the ascaris infestation with the vitamin deficiency. On the average, the infestations in the group provided with adequate vitamin were the heavier, but marked infestation eventually took place in all the animals. Although some respiratory disturbance was noticed, rapid and difficult breathing and a frequent cough, no mention is made of the condition known as " thumps " in the young pigs which were infected experimentally. Severe diarrhoea, which followed the disappearance of lung symptoms, after administering the larvae in one instance, is thought to have been due to the arrival of large numbers of larvae in the intestines.

II. Vitamin A deficiency was found to have a marked effect in lowering the resistance of young rats (25 to 27 days old) to infestation with *T. spiralis* ; this was found to occur within three weeks of placing the rats on the deficient diet and was manifested in the persistence of adult worms in the intestine and the development of a greater number of larvae in the muscles. These rats also failed to develop any immunity to a second infestation although the controls became completely immune. The resistance of older rats (one to three months old) was not broken down to nearly the same extent by the deficient diet.—E. L. TAYLOR.

DOEVE, W. C. A. (1933). Nogmaals Cascado. [**A Further Case of " Cascado " (Filarial Dermatitis of Cattle)**].—*Ned.-ind. Bl. Diergeneesk.* **45.** 401-405.

Referring to the article by BUBBERMAN and KRANEVELD [this *Bull.* **4.** 663.], who consider *Stephanofilaria dedoesi* to be the cause of " cascado," the author is convinced that there are still other influences which play an important part in the cause of this skin disease. *Penicillium* infection, which was formerly indicated by Doeve as being a causative agent, is probably not of great importance. According to his experience the disease is nearly always limited to districts where the shade is very thick.—J. VAN DER HOEDEN (UTRECHT).

IMMUNITY.

CLAUSEN, S. W. (1934). **The Influence of Nutrition upon Resistance to Infection.** —*Physiol. Rev.* **14.** 309-350. 6 tables. [5½ pp. refs.]

This is a review of the literature dealing chiefly with infections of bacterial origin. It is concluded that susceptibility to infection is not as a rule affected by diet, but that resistance to infection may be greatly reduced by deficient diet. Deficiency of vitamins A and C appears quite definitely to lower resistance and a lack of vitamin B complex may do so in certain cases ; this is not proved to be the case as regards lack of vitamin D. The existence of a partial deficiency of vitamins may, it is suggested, result in loss of resistance to infection, though this cannot be said, from present evidence, to have been clearly established.

—R. G. LINTON.

NELSON, J. B. (1933). **The Reaction of Antisera for B. actinoides.**—*J. Bact.* **26.** 321-327. 2 figs., 1 table. [2 refs.]

An organism isolated from the aural exudate in middle ear disease of the albino rat had previously been shown to be somewhat similar to *Actinobacillus actinoides* of calf origin. Suspensions of rodent and bovine varieties were prepared and it was found that serum prepared against a rodent strain agglutinated rodent strains to a dilution of 1 : 3,200 and a bovine strain to 1 : 400. Serum prepared against the bovine organism agglutinated both suspensions to 1 : 800. Further antigenic analysis was not carried out; the observations, however, indicate a similarity though not identity of the two types of bacteria.

Both organisms showed an atypical growth characterized by the formation of spherical bodies when grown in the presence of homologous antisera. When grown in the heterologous sera, occasional groups of degenerated atypical forms were apparent.—R. LOVELL.

DISEASES, GENERAL.

I. STECK, W., & STIRNIMANN, J. (1934). Studien zur Beurteilung der spontanen Blutsedimente in der klinischen Diagnostik der Pferdekrankheiten. [**The Significance of the Volume of Cells Spontaneously Sedimented in the Diagnosis of Horse Diseases**].—*Schweiz. Arch. Tierheilk.* **76.** 167-181 and 241-255. 2 figs., 2 tables. [29 refs.]

II. CARPENTIER, G., GUILLOT, G., & GUILHON, J. (1934). Au sujet de la détermination de l'indice de vitesse de chute des hématies. [**The Determination of the Blood Sedimentation Index**].—*Rec. Méd. vét.* **110.** 321-328. 2 figs., 1 table. [5 refs.]

III. GOSSET, G. (1934). La réaction de sédimentation au cours de quelques infections observées chez le Cheval. [**Red Blood Cell Sedimentation Test in Horse Diseases**].—*Bull. Acad. vét. Fr.* **7.** 178-180. [1 ref.]

I. The measurement of the volume of cells obtained by allowing citrated blood to sediment is not a satisfactory method of blood examination, because the variations observed are relatively poor indications of changes in the circulating blood. They are moreover influenced by breeding, whilst exercise, pain and fright cause a notable increase of volume which is roughly proportional to the increase of pulse rate.

In thoroughbreds a volume under 32 per cent. is regarded as pathological and one of 35 per cent. as normal, whilst in other horses a volume of 25 per cent. is abnormal and one of 30 per cent. normal. Leucocyte values under 0·5 per cent. of the blood volume are regarded as normal and those over 0·8 per cent. as evidence of leucocytosis. The volume of sediment obtained by centrifuging averaged 0·91 per cent. of that obtained by spontaneous sedimentation.

The erythrocyte volume is lessened in infectious anaemia and in secondary anaemia after strangles or chronic broncho-pneumonia, and increased after severe colic and haemoglobinuria, an increase in the latter disease being prognostically unfavourable. Increased leucocyte volume suggests the formation of new centres of disease, e.g. in strangles and tuberculosis.

In acute febrile diseases and in various anaemic conditions the rate of sedimentation is increased.

10 c.c. of blood was drawn direct into a graduated cylinder 25 cm. long containing 1·1 c.c. of 7·5 per cent. sodium citrate and crystals of naphthalene.

II. The authors give examples of the difference and lack of any relation between the sedimentation index used by CÉSARI, viz. the length of the column of cleared plasma after 30 minutes sedimentation divided by its length after 24 hours, and that of SAUMUR, viz. the height of the column of cells after 24 hours divided by its height after 30 minutes.

III. Gosset deals briefly with the diagnostic value of the sedimentation rate.—A. W. STABLEFORTH.

MISSENARD. (1933). Sur la clinique de l'Ecole vétérinaire de Bamako. [**The Clinic of the Veterinary School at Bamako**].—*Rec. Méd. vét. exot.* **6.** 185-191.

This is an account of the common diseases of animals brought to the above clinic in French West Africa for treatment. Of particular interest are the following :–

Almost every horse is affected with " souma ", *Trypanosoma cazalboui* [*vivax*] infection. In the early stages, novarsenobenzol (2 g. repeated in 8 hours) is efficacious, and for more advanced cases a course of treatment with tartar emetic, sometimes in combination with " atoxyl ", is given. Equine piroplasmosis is rare, *Babesia equi* having been observed once only. Blood microfilariae, which appear to be non-pathogenic, are common in horses.

Sarcoptic mange is common in cattle but psoroptic mange is uncommon ; ringworm is seen and *Tryp. vivax* and *Babesia bigemina* infections are common. Rinderpest was prevalent before sero-vaccination was carried out on all herds around Bamako. Contagious bovine pleuro-pneumonia is the most serious disease of cattle. As vaccination has not been used everywhere to control the disease, the author uses " novarsenobenzol " for curative purposes. It is said to be efficacious in the early stages only.

The local sheep diseases include caseous lymphadenitis, sheep scab, sarcoptic mange, louse and tick infestation, helminth parasitism, *Tryp. vivax* infection, piroplasmosis and pasteurellosis.

Dogs and cats suffer from the common diseases ; distemper causes much trouble and two cases of rabies in dogs have been confirmed.

Notes are also given on poultry diseases.—J. E.

I. CERNAIANU, C. (1934). Les maladies infectieuses des volailles. [**Infectious Diseases of Poultry**].—*Bull. Off. internat. Epiz.* **8.** 241-323. [35 refs.]

II. STYLIANOPOULOS, M., & DEBONÉRA, G. (1934). Les maladies des volailles en Grèce. [**Fowl Diseases in Greece**].—*Rev. gén. Méd. vét.* **43.** 193-212. 2 tables. [8 refs.]

I. The author deals very fully with all the more important infectious diseases of poultry, describing at great length the incidence, aetiology, pathology, clinical symptoms and *post-mortem* diagnosis of each disease.

The article is divided into (a) diseases of chickens and pullets and (b) diseases of adults ; (a) includes bacillary white diarrhoea [*Bact. pullorum* infection], diseases due to members of the salmonella group – *Bact. aertrycke* and *Bact. anatum* – a white diarrhoea due to *Bact. coli* and acute coccidiosis ; (b) includes avian typhoid, fowl cholera, fowl pox, contagious catarrh, tuberculosis, infectious leucaemia, fowl paralysis (neurolymphomatosis), pseudotuberculosis, avian spirochaetosis and diseases due to *Bact. aertrycke* and *Bact. enteritidis* Gärtner.

A very full discussion, occupying 88 pages, on the methods of control to be used against these diseases is given.

II. The infectious fowl diseases in Greece in order of importance are :–

fowl cholera, *Bact. pullorum* infection, spirochaetosis, fowl pox, avian typhoid and contagious catarrh. Most of these diseases are seasonal in incidence—cholera in the winter, spirochaetosis in summer and typhoid and fowl pox in spring and autumn. The incidence of cholera appears to be diminishing, spirochaetosis and piroplasmosis, depending on biological transmission, remain stationary, while typhoid and *Bact. pullorum* infection are increasing with the growth of the industry.

Each disease is very fully described, special note being made of the methods of control in use in Greece. Vaccination is carried out with considerable success against fowl cholera and fowl pox. Vaccination against fowl typhoid has given variable results and the main control (as in *Bact. pullorum* infection) is by detection of carriers by the serum-agglutination test. Excellent results have been obtained in the treatment of spirochaetosis by intramuscular inoculation of 2·6 c.c. of a 1 : 100 solution of " atoxyl ".

Fowl plague, tuberculosis and laryngotracheitis are practically unknown in Greece.—R. F. GORDON.

MARSHALL, D. (1934). **Some Diseases of Pigs.**—*New Zealand J. Agric.* **49.** 65-71.

The author discusses pig diseases prevalent or known in New Zealand. He first mentions mortality in piglets due to poor ante-natal diet in the sow and, secondly, mortality in young pigs due to pasteurella infection and necrotic enteritis, together with control measures. Finally, he describes skin diseases, external and internal parasites, and tuberculosis and suggests methods for their treatment or control. Paralysis is of special interest and appears to be connected with the practice of feeding skim-milk without provision for substituting important food constituents so lost.—C. S. M. HOPKIRK.

GILKES, H. A. (1934). **Two Little-Known Diseases of Northern Rhodesia: Onyalai and Chiufa.**—*Trans. R. Soc. trop. Med. Hyg.* **27.** 495-498. [Abst. from abst. in *Trop. Dis. Bull.* **31.** 751-752].

The author mentions that " chiufa " in human beings, an acute inflammation of the rectum observed in Northern Rhodesia, is said by natives to " date back to the epidemic of rinderpest in 1895 ". The aetiology is obscure and there is no evidence of infection from animals.—J. E.

WILLIAMS, W. L. (1934). **A Clinical Study of Bovine Twins and Free-Martins.** —*Cornell Vet.* **24.** 108-131. 8 figs. [36 refs.]

A study has been made of bovine twins and freemartins and comparisons made with the normally multiparous domesticated animals. The author, after long and careful study, concludes that twinning is an undesirable pathological condition in bovines which can, to a great extent, be controlled. The chief factors in control are, firstly, the proper handling of dairy calves during the milk-feeding period so that the genital development and the associated normal growth of heifers does not cause them to arrive at the breeding age with juvenile reproductive organs. Secondly, *post-partum* rebreeding should not be too early in order that the reproductive system may be allowed to regain its equilibrium. Finally, the breeding of cows with recognizable ovarian diseases and disorders is an undesirable practice, leading amongst other complications to a tendency to twins.—HARVEY S. PURCHASE.

I. GUÉROT, H. (1933). Contribution à l'étude de l'Hémophilie chez le Cheval, l'Ane et le Mulet. [**Haemophilia in the Horse, Ass and Mule**].—*Thesis for Docteur vétérinaire, Lyon.* pp. 60. [15 refs.]

II. TRUCHE, C., & BAUCHE, J. (1934). Manifestations hémorragipares chez la Poule. [**Haemorrhagic Diseases of Fowls**].—*Bull. Acad. vét. Fr.* **7.** 86-90. [8 refs.]

III. FAIRLEY, N. H. (1934). **Studies on Blood Regeneration in Tropical Disease.** —*Trans. R. Soc. trop. Med. Hyg.* **27.** 545-573. 18 graphs. [8 refs.]

I. The bleeding time and coagulation time of the blood are very similar in the horse, mule and ass.

Published results of true haemophilia in the solipeds are rare. There are to be found in the literature published cases of haemophilia-like bleeding occurring some days after castration which suggest that in some cases the absence of a testicular hormone may be a causative factor.

II. A description of the mortality in a pen due to spontaneous subcutaneous and other internal haemorrhages is given. The liver and spleen were hypertrophied in some of the cases. The blood clotted poorly. All the birds appeared leucaemic. The owner reported that the parent stock had shown blood stains in the fowl houses, but he could not find any visible cases of external bleeding. The author suggests the possibility that the condition is due to haemophilia.

III. Pathogenic protozoa and probably other specific infective agents exert an inhibitory action on the bone marrow response, preventing reticulocytosis and blood regeneration. Also it is found that in certain protozoal anaemias, specific drug therapy is automatically followed by rapid blood regeneration.

—HARVEY S. PURCHASE.

PULLAR, E. M. (1933). **Three Interesting Abnormalities. Partial Atresia Ani-Internus in a Pig. Large Meckel's Diverticulum in a Fowl. Large Abdominal Cyst in a Fowl.**—*Aust. vet. J.* **9.** 64-67. 3 figs. [4 refs.]

The first abnormality was a case of partial atresia ani internus in a pig. The lumen of the internal anus was almost occluded by a thin membrane, perforated near its centre by an opening 3 mm. in diameter. The caudal surface of the membrane showed wrinkling and radial scars. It is concluded that, at birth, the internal sphincter must have been partially or entirely closed by a septum which ruptured, but healed later. The specimen was from a pig five months old, in good condition at the time of slaughter.

A second abnormality was seen in a fowl, which showed pronounced abdominal distension. Autopsy revealed the presence of an enormous Meckel's diverticulum, partially filled with faeces, partially with gas. The diverticulum was attached to the ileum by a pedicle similar in structure, diameter and lumen to the intestine with which it was continuous. It is stated that this type of abnormality is frequently seen in fowls.

The third abnormality was a large abdominal cyst in a fowl. The distension was so great that the bird had assumed a penguin-like attitude to relieve pressure on other abdominal viscera. During an exploratory operation, a large abdominal cyst was accidentally ruptured. It contained about 500 c.c. of colourless fluid. Subsequent autopsy showed the cyst to be located in the ligament of the right ureter. Bacteriological examination of the contents of the cyst showed an organism of the *Shigella* type, the cultural and morphological characteristics of which are given.—H. McL. GORDON.

HOFLUND, S. (1934). Ueber Harnsteine im wurmförmigen Anhange des Penis beim Schaf- und Ziegenbock. [**Urinary Calculi in the Vermiform Appendix of the Penis in Sheep and Goats**].—*Arch. wiss. prakt. Tierheilk.* **67.** 340-346. 1 fig. [12 refs.]

This is a review of the literature and the case records of urethral calculi in seven rams and one goat, two cases being in dead animals. In the remaining six cases, the condition was diagnosed during life and four of them were saved by the operative removal of the calculus, which in every case was situated in the vermiform extension of the penis. This was amputated immediately behind the stone. The conflicting views of various writers as to whether this procedure causes sterility are discussed. JWANOW [(1929). *Vet. J.* **85.** 351.] states that he proved that the operation does not cause sterility.—J. E.

PARSHALL, C. J. (1934). **Natural and Experimentally Produced Gangrenous Mastitis in Cows.**—*Cornell Vet.* **24.** 146-155. 3 figs. [1 ref.]

Although not common, gangrenous mastitis is of importance because the affected quarter is lost and because death of the animal is a frequent sequel. The onset of the disease is sudden and the course rapid. Cases usually occur sporadically but several cases may appear in a herd in close succession. Parshall records that, in one herd of 125 cows, four cases developed within three months, whilst in another herd of 600, 11 cases occurred in 1932 and seven cases in 1933. Of the 22 cases met with in a period of two years in these two herds, 15 occurred during the cold rainy weather. Most of the cases occurred in young healthy cows between the second and sixth months of lactation. The initial inflammatory symptoms were acute and quickly gave way to those of typical gangrene. Pronounced lameness was usually the first symptom noticed.

It is the bacteriological findings which are, however, of the greatest interest. Of 12 cases, six gave *Staphylococcus aureus* and *Clostridium welchii*, three *S. aureus* and another anaerobe, and two *S. aureus* only, whilst in one case cultures were negative. Further, considerable mastitis of a less severe nature was also occurring in these two herds and from these *S. aureus* alone was obtained.

Cultures of *Cl. welchii* or of *S. aureus* when injected alone produced relatively mild mastitis, the staphylococcus producing subacute but transient disturbance. When, on the other hand, a mixture of the two organisms was injected, a typical gangrenous mastitis occurred in three out of six cows infected. Anti-anaerobic serum was tried and is suggested as worthy of further trial.—A. W. STABLEFORTH.

I. DE BOER, E. (1934). Neurolymphomatosis Gallinarum. I. [**Fowl Paralysis. I.**].—*Tijdschr. Diergeneesk.* **61.** 449-462. [90 refs.]

II. TE HENNEPE. (1934). Oogziekten bij Neurolymphomatosis Gallinarum. [**Eye Changes in Fowl Paralysis**].—*Ibid.* 463-466. [4 refs.]

I. The author gives a short review of the literature on fowl paralysis and the conclusions which he draws from it.

II. A résumé of the literature on the subject is given. In Holland there seems to exist a certain variation in susceptibility according to the different breeds of fowls.

KAUPP, in 1921, described blindness occurring in fowl paralysis. L. P. DOYLE, in 1926, described the fixed pupil, which he ascribed to iritis, and MCGAUGHEY and DOWNIE, in 1930, referred to iritis. FINDLAY and WRIGHT studied the changes of the eye and central nervous system in detail and found a cellular infiltration along the optic nerves and extending into the occipital lobe of the brain. Their report is quoted at some length.—J. VAN DER HOEDEN (UTRECHT).

CARRÉ, H. (1933). Contribution à l'étude clinique des entérites des agneaux (Paraplégie enzootique). [**Enteritis of Lambs (Enzootic Paraplegia)**].—*Rev. gén. Méd. vét.* **42.** 665-696. [13 refs.]

Lambs 14 to 30 days old suffer from a disease considered by previous workers to affect the central nervous system and, consequently, called enzootic paraplegia and cerebrospinal meningitis. Affected lambs show stiffness and, later, apparent paralysis of the limbs, resulting in inability to stand. These symptoms are due to inflammatory changes in groups of muscles, followed, in untreated cases, by muscle degeneration. The faeces are blackish, dry, covered with mucus, and are often found to contain coccidia. The urine contains albumen. Pustules are often found on the parts of the skin devoid of wool. Affected lambs when fed on milk recover completely in 3 to 12 days. The faeces become soft, yellowish, free from mucus, and the coccidia disappear. The cutaneous pustules also clear up.

The cause of this condition is the ingestion of coarse food suitable only for older sheep. Lambs not receiving sufficient milk are thus the ones which become affected. This unsuitable food leads to hypertrophy of the rumen and sets up enteritis. Absorption of toxic products from the bowel then occurs.

The coccidia are not the cause of the disease, as typical cases are met with in which these and other parasites are absent ; indeed, the author considers that coccidia are commensals, which become pathogenic only subsequent to some irritation of the intestinal mucous membrane.—A. Brownlee.

I. Isherwood, R. (1934). **Some Aspects of Milk Fever.**—*Vet. Rec.* **14.** 535-542.

II. Bell, G. H., & Morris, S. (1934). **The Oxytocic Property of the Blood and its Relation to Milk Fever in Cows.**—*Brit. J. exp. Path.* **15.** 143-147. 2 figs. [12 refs.]

I. A review presented to the North Wales division of the National Veterinary Association, followed by considerable discussion.

II. The oxytocic [ecbolic] power of the blood is shown to rise to five units per litre in the last weeks of pregnancy and to fall at calving. In milk fever the level is raised to that of the week before calving. The hypocalcaemia and occasional hyperglycaemia of milk fever are compared with the blood picture after injection of pituitrin. It is suggested that milk fever may be due to hormone imbalance and excess of pituitary secretion into the blood. In the one experiment tried, injection of pituitrin into a recently calved cow did not induce the disease.

—H. H. Green.

Oxer, D. T. (1934). **Pregnancy Paralysis of Ewes. Feeding Experiments in Relation to the Disease.**—*J. Coun. sci. indust. Res. Aust.* **7.** 21-28. 2 figs., 2 tables. [8 refs.]

Experiments were undertaken to determine whether pregnancy paralysis could be induced by subjecting pregnant ewes to the various conditions which have been considered by different authors to cause the disease.

In the first experiment 35 pregnant ewes were divided into two groups. One was depastured normally while the other was reduced in condition six weeks prior to lambing by placing in a small paddock poorly grassed. No cases of the disease occurred in either group, although a number of twins were subsequently born. In the second experiment 106 ewes were divided into groups and hand fed. The feeding was regulated so that some maintained their condition and the others either gained weight or received a check in nutrition six weeks before lambing. The results were again negative.

The third experiment was more carefully conducted and the ewes were weighed at fortnightly intervals. 120 ewes were " flushed " before mating with the object of increasing the lambing percentage. They were then divided into

four groups and their nutrition controlled so that groups A and D gradually gained in condition, group B gradually lost condition and group C gradually gained until six weeks before lambing when the ration was reduced to ½ lb. of oats and lucerne chaff mixture per day for one week. Groups A, B and C received enforced exercise but group D did not. Almost 100 per cent. of lambs were born, including eight pairs of twins and one set of triplets, but no ewes developed pregnancy paralysis.

Factors which may have mitigated against positive results are discussed but it is considered that a definitely negative result was obtained with a check in nutrition six weeks before lambing.—W. I. B. Beveridge.

Riddell, W. H., Hughes, J. S., & Fitch, J. B. (1934). **The Influence of Phosphorus Deficiency in Dairy Cows on the Coefficient of Digestibility and the Balance of Calcium and Phosphorus.**—*J. agric. Res.* **48.** 167-170. 2 tables. [5 refs.]

Two animals were maintained on a ration 10 per cent. above the Morrison standard for digestible nutrients. A third received the same ration plus 100 g. per day of monosodium phosphate, on which it remained in positive Ca and P balance and showed a blood level of 8·72 mg. inorganic P per cent. The two cows on the P-low ration passed into negative mineral balance, and the blood P fell to 1·20 to 1·34 mg. per cent. over the nine months experiment. Digestibility coefficients of the ration were as high on the low phosphorus intake but the deficiency was attended by poorer appetite and reduced food consumption.—H. H. Green.

Aston, B. C. (1934). **The Misuse of Lime, with Special Reference to Bush-Sick Lands.**—*New Zealand J. Agric.* **49.** 31-36 and 80-85.

The author draws attention once more to the adverse effect of lime top-dressings and licks containing lime on cattle running on " bush-sick " pastures (so-called iron deficiency). Many references are made to available literature on the liming of light soils.

The summary states that there is danger in liming pastures on sandy soils and that positive injury to stock may result ; also, that in making stock licks in general, alkaline compounds such as lime or soda should not be used.

—C. S. M. Hopkirk.

Filmer, J. F. (1933). **Enzootic Marasmus of Cattle and Sheep. Preliminary Report having Special Reference to Iron and Liver Therapy.**—*Aust. vet. J.* **9.** 163-179. 1 table, 6 graphs. [21 refs.]

A fatal disease of cattle and sheep, occurring in the Denmark district of Western Australia, is described and named " enzootic marasmus ". The disease is characterized by progressive emaciation and anaemia and bears a striking resemblance to " bush sickness " in New Zealand, " nakuruitis " in Kenya, " salt sick " in Florida and " pine " in Scotland.

The disease occurs only on certain limited areas which, however, do not present any special geological features. Calves from six to eighteen months of age are the animals most frequently affected, but aged cows and sheep of all ages are also affected. The principal symptoms are progressive emaciation, anaemic appearance of visible mucous membranes, anorexia and diarrhoea. In cows, lactation is diminished and oestrum seldom occurs. Death occurs in from six weeks to two years after symptoms are first noticed, the shorter course being usually observed in young animals. On *post-mortem* examination, the liver usually shows marked fatty changes and occasional punctiform haemorrhages, the mucous membranes sometimes present light green vesicles and the walls of the abomasum

are often thickened and oedematous. In histological sections, haemosiderin can constantly be detected in the spleen and, occasionally, in the liver and kidneys. Haematological examinations revealed the following abnormalities : low red cell count, anisocytosis, low haemoglobin percentage, low colour indices and, sometimes, a hypoplasia of erythrogenic tissue in the bone marrow.

Four badly affected heifers were removed to " sound " country and all recovered. It is a common practice to cure stock affected with the disease by transferring them to " sound " country. Manganese sulphate, potassium iodide, oaten hay grown on " sound " country and various other substances failed to prevent the disease in sheep. Daily doses of 1·2 g. of iron and ammonium citrate, together with manganese or iodine, checked the fall in the weight of sheep but only very slow growth was induced. 0·18 g. of iron, in the form of iron and ammonium citrate, together with a small amount of copper sulphate, was administered daily to two groups of sheep. These sheep showed some improvement as compared with controls but growth was decidedly sub-optimal. However, when the dose of iron was trebled, a spectacular increase in both weight and haemoglobin content of the blood followed. 1·16 g. iron as ferrous carbonate also produced a great improvement as compared with control animals. Spathic iron ore containing approximately 58 per cent. ferrous carbonate was administered to four calves in 10 and 20 g. doses, but the results were irregular and disappointing, two animals developing the disease. Doses of this ore containing from 0·6 to 3·8 g. Fe induced only slow growth in lambs. Limonite, containing approximately 50 per cent. Fe in the form of hydrated ferric oxide, gave excellent results in both calves and sheep. This ore is at present being used in the form of a lick, of which calves receive the equivalent of 25 g. Fe daily ; it is hoped that this will prove to be a practical solution of the problem. A prophylactic and curative effect was also obtained with " heparidine ", a preparation of liver dried at low temperatures, with raw liver and with heat dried liver. Various other substances have also been tried. The efficacy of drugs was not found to be in direct proportion to their iron content, the dose of which, in effective remedies, varied from 0·02 to 11 g. Fe in sheep. In general, the blood picture improves with recovery as indicated by increase in weight, but there is a tendency for the former to lag.

The diseases which are mentioned above as being similar to, and probably identical with, "enzootic marasmus", have been usually held to be due to a deficiency of iron. The iron requirements of the calf are discussed and it is concluded that animals receive sufficient iron from pastures on the affected areas under consideration here. The varying efficacy of the iron compounds tested cannot be explained by the availability of the iron. It was found that iron was present in the organs of affected animals in greater amounts than in those of normal animals. For these reasons, it is doubted if iron deficiency is the cause of "enzootic marasmus " and a tentative hypothesis is advanced that the disease is due to some mineral necessary for the metabolism of iron. This would explain several features of the disease which are otherwise confounding. Further experiments are in progress.

—W. I. B. Beveridge.

PUBLIC HEALTH.

Grinsted, P. (1934). Nogle Undersøgelser over varmebehandlede Maelkeformers Bakterieindhold. [**Investigations into the Bacterial Content of Milk Heated by Different Methods**].—*Maanedsskr. Dyrl.* **45.** 481-496. 1 table. [1 ref.]

On an average, the bacterial content of milk heated in the Stassano apparatus has been found to be too high. This is especially due to difficulties in cleaning the system of pipes. When the apparatus is being used, the milk that first passes through it frequently shows a high figure, but at a later stage, the bacterial content is more satisfactory.

In the case of slow pasteurization, the bacterial content was found to be satisfactory when the milk left the apparatus, but many bacteria appeared in it after the subsequent passage through cooling pipes and receptacles.

These two methods of heat treatment afford a safeguard against infections originating from milking animals, but special measures are required in connection with cleaning and scalding of pipes and sterilization of bottles. Slow pasteurization of milk in bottles is technically more difficult than the above method and the subsequent storing until sale takes place requires greater precautions as regards effective cooling.—H. C. Bendixen (Copenhagen).

Rambe, L., & Hedström, H. (1934). En scarlatina-angina-epidemi härledd från säregen streptocockmastit hos ko. [**A Scarlatina-Angina-Epidemic Resulting from a Peculiar Streptococcic Mastitis in a Cow**].—*Skand. Vet.-tidskr.* **24.** 57-115. 8 figs., 8 tables. [12 refs.] [English summaries].

During 14 days from Feb. 13th, 1933, 24 cases of scarlatina and 70 rather severe cases of angina were reported in the town of Norat (Sweden). Those affected had taken milk from a certain farm. An investigation was carried out at the farm on Feb. 20th ; all persons employed there proved to be in good health. One of the cows, however, was ill with a swollen and somewhat tender udder. From the secretion obtained from this cow and from swabs taken from the throats of the angina and scarlatina patients, the same β-hemolytic streptococcus type was isolated. Seven days later, milk from this cow having been withdrawn from consumption, no further cases of angina or scarlatina occurred.

The cow in question is supposed to have had the udder infected about Feb. 5th. At that time it had rather large wounds on the tips of the teats, and the owner, who attended to the milking (machine) just on that day, had been ill during the preceding days with a pharyngeal abscess. The abscess ruptured on Feb. 3rd.

The streptococci isolated from the angina and scarlatina patients produced an experimental mastitis in another cow, *via* wounds on the tip of a teat.

The article consists of an epidemiological investigation written by Rambe and a bacteriological one written by Hedström.—H. C. Bendixen (Copenhagen).

I. Hollingworth, W. G. (1934). **Municipal Food Hygiene – a Problem for the Veterinary Profession to enhance.**—*J. Amer. vet. med. Ass.* **84.** 373-380. [1 ref.]

II. Koen, J. S. (1934). **Municipal Meat, Milk and Food Inspection.**—*Ibid.* 380-384.

III. —. (1934). **Report of Committee [U.S. Live Stock Sanit. Ass.] on Meat and Milk Hygiene.**—*Ibid.* 389-391.

IV. Schalk, A. F. (1934). **Veterinary Service in Public Health Control Work – the Largest Undeveloped Field in Veterinary Science.**—*Ibid.* 392-399.

I. The author discusses the place of the veterinarian in relation to food hygiene.

II. The author states that meat inspection is largely a federal service. Approximately 75 per cent. of meat offered for sale in the United States is inspected, 65 per cent. under federal supervision, 10 per cent. under municipal and the

25 per cent. remaining is ineligible for federal inspection. Only one standard of inspection should be recognized and that should be the U.S. Bureau of Animal Industry standard.

Milk inspection is largely a municipal service. This inspection is carried out under the standard milk ordinance of the U. S. A. public service, but all cities have not adopted the standard milk ordinance and in some places where they have adopted it, the provisions of it are not in force.

III. This report indicates that there is considerable variation in the policies and practices relative to meat and milk hygiene in various cities, and the committee urge a uniformity of inspection as far as practicable. Inspection of milk should begin on the farms, at the source.

The committee submit the following recommendations :– That the administration, laws, rules and regulations, be considered the function of the livestock sanitary officials of the various states ; that milk inspection be considered of first importance.

IV. The author points out that the veterinary profession is only in the first stage of development of the many possibilities in the field of public health work.

—Brennan de Vine.

Barnicoat, C. R. (1934). **" Store-Burn " in Frozen-Meat By-Products.**—*N. Z. J. Sci. Tech.* **15.** 248-254. 2 figs., 3 tables.

" Store-burn " is a term given to a light red discolouration that develops on livers and kidneys during cold storage. Experimental work has shown that this is superficial and is due in some way to loss of moisture during freezing. By cooling at room temperature before packing, the moisture loss is not so great as when packing is carried out immediately after sorting. Packing trials with various papers were made and no " store-burn " occurred when transparent cellulose paper of high grade was used. This paper allowed no loss of moisture.

Dipping livers and kidneys in serum was found to assist in preserving a good colour when they were taken from cold store.—C. S. M. Hopkirk.

Empey, W. A., & Vickery, J. R. (1933). **The Use of Carbon Dioxide in the Storage of Chilled Beef.**—*J. Coun. sci. indust. Res. Aust.* **6.** 233-243. 4 tables. [10 refs.]

Under the conditions in which the experiments were carried out, attack on the moister superficial tissues by bacteria – mainly various strains of *Achromobacter* – has been the chief cause of wastage in chilled beef stored for prolonged periods. Deterioration, caused by growth of moulds, has been relatively insignificant owing, mainly, to the fact that moulds have constituted an extremely small percentage of the initial contamination.

The duration of safe storage, both in carbon dioxide and in air, was largely determined by the numbers of bacteria, acquired by the beef during dressing and initial chilling, which were capable of relatively rapid proliferation at a temperature of 1°C.

The extent to which small concentrations of carbon dioxide, of the order of 10 to 12 per cent., in the storage environment, restricted the rate of growth of *Achromobacter*, determined the length of storage possible without appreciable deterioration occurring in the beef, and this period was approximately 40 per cent. greater than that possible under similar conditions of storage in air.

Beef obtained from meat works in which *Achromobacter* constitutes the main type of initial infection, may safely be held in the chilled condition for a period of 53 days [approximately equivalent to a period of transport of 45 days], provided

that strict hygienic conditions are maintained during slaughter, dressing and chilling, in order to ensure an extremely low bacterial infection, and provided also that concentrations of carbon dioxide, of the order of 12 per cent., be employed in the storage environment.—E. MUNCH-PETERSEN.

I. WALTHER, K. (1933). Zur Kasuistik der Fleisch- und Wurstvergiftungen. [**Meat and Sausage Poisoning**].—*Zlb. Bakt. I. (Orig.).* **130.** 375-380. [11 refs.]

II. HENNINGER, E. (1933). Versuche über die Haltbarkeit von Fleischvergiftungserregern in Gefrier-, Salz- und Pökellebern. [**Viability of Food Poisoning Organisms in Frozen, Salted and Pickled Liver**].—*Z. Fleisch- u. Milchhyg.* **44.** 84-89. 3 tables. [2 refs.]

I. An account is given of food poisoning in 162 soldiers associated with ingestion of preserved liver sausage. *Bact. enteritidis* or *Bact. newport* were isolated from the faeces of eight patients, both organisms being present in some of the cases. It is pointed out that preserved as well as fresh meats may play a role in food poisoning. [It is a more common occurrence in this country to find made-up meat, rather than fresh meat, associated with food poisoning].

II. Samples of liver which were naturally or artificially infected with *Bact. suipestifer*, *Bact. aertrycke* or *Bact. enteritidis* were kept under varying conditions and cultures were made at intervals. It was shown that such organisms could be cultured up to four months after the samples had been kept in the cold at 0° to 4°C., or after having been salted and kept cold. They could be cultured up to six months from pickled and up to 15 months from frozen samples. The biochemical and serological characteristics of the bacteria remained unchanged. The strains from the frozen specimens were pathogenic for mice up to nine months from the commencement of the experiment.—R. LOVELL.

THERAPEUTICS.

EALES, C. E. (1934). **The Testing of Various Disinfectants against Corynebacterium Ovis (the Bacillus of Caseous Lymphadenitis).**—*Austral. Vet. J.* **10.** 26-27. 1 table.

The germicidal efficiency of various commercial sheep dips against *C. ovis* was tested out *in vitro*. Using the concentrations recommended by the makers for dipping sheep, the organism was killed by most preparations after two minutes' exposure. [The temperature at which the tests were conducted is not recorded].
—W. I. B. BEVERIDGE.

CREMONA, P. (1934). Sulla somministrazione per os dei sali di mercurio nella cura del farcino criptococcico. [**Mercury Salts** *per os* **in the Treatment of Epizootic Lymphangitis**].—*Profilassi.* **7.** 244-245. [5 refs.] [Abst. from English and French summaries].

The author obtained negative results in attempts to cure epizootic lymphangitis with biniodide of mercury administered *per os*.—J. E.

VAN ZWIETEN, M. (1934). Bijdrage tot de kennis van Geneesmiddelresistentie van Surratrypanosomen. [**Drug-Fastness of Surra Trypanosomes**].—*Tijdschr. Diergeneesk.* **61.** 350-356. [English, French and German summaries: abst. from orig.]

As surra is one of the most widespread diseases of animals in the Dutch Indies, the appearance of drug-fast strains of *Trypanosoma evansi* after treatment is very important for the control of the disease. In white mice which had been treated the parasite became strongly drug-fast against " naganol " and even more markedly so against " atoxyl ". At the same time, " naganol "-fastness caused " atoxyl "-fastness and often also a resistance towards other preparations such as " salvarsan ". On the other hand, no resistance was developed for antimony preparations, except for " neostiban ".

Inoculating a strain that had become drug-fast in certain animals (cow, dog, guinea pig, rabbit, rat), the sensitiveness to the drug concerned seemed to be recovered when using mice, but when the inoculation in mice was continued, the drug-fastness returned. When a mixture of resistant and non-resistant strains was used, the latter always dominated. When very small doses of trypanosomes were used (as in natural infection by *Stomoxys*), the drug-fastness soon disappeared.

The author concludes that cows and buffaloes should be treated with large doses of " naganol " or, preferably, simultaneously with " naganol "-" atoxyl "-tartar emetic. It is highly probable that strains which have become drug-resistant in horses will regain sensitiveness by passage through cows or buffaloes.

When buffaloes are re-infected with non-resistant trypanosomes, these sensitive parasites will take the place of the resistant ones already present. In the case of natural infection by tabanids with a drug-fast strain, the resistance soon decreases.—J. VAN DER HOEDEN (UTRECHT).

STERNBERG, E. J. (1934). Ueber die Wirkung des Präparates " R 123 " gegen Vogelmalaria. [**The Action of " R 123 " on Bird Malaria**]—*Z. Hyg. InfektKr.* **116.** 1-3. [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 699. Signed by E. D. W. Greig].

Observations on the action of a preparation of the quinine series, " R 123," on bird malaria.

In his tests the author did not employ canaries but siskins (*Spinus spinus*) and flax siskins (*Acanthis linaria*). The chemical formula of the preparation was not divulged. As a result of his experiments the author finds that the preparation is weaker than plasmoquine in its action on bird malaria, the chemotherapeutic index of " R 123 " being 26·6, whilst that of plasmoquine is 40.

WITTE, J., & SCHAAF, J. (1934). Prüfung der Widerstandsfähigkeit des Virus der Bornaschen Krankheit und der Hühnerpocken gegen chemische Desinfektionsmittel, insbesondere gegen Trosilin. [**The Resistance of the Viruses of Borna Disease and of Fowl Pox to Chemical Disinfectants, especially to " Trosilin "**].—*Z. InfektKr. Haustiere.* **45.** 265-272. 3 tables. [15 refs.]

Using firstly the " Keimträger " method, in which the disinfectant solution is allowed to act on filter paper previously soaked in a filtrate of brain tissue taken from rabbits dead of Borna disease and, secondly, the mixture method, in which the virus filtrate is mixed with the disinfectant solution, the authors tested the action of " trosilin " (sodium silicate containing active chlorine), one per cent. caustic soda, three per cent. phenol, dilute milk of lime (Kalkmilch), 0·1 per cent. mercuric chloride and one per cent. formalin. The duration of the individual tests varied, but it was found that, of the above chemicals, " trosilin " in 0·5 to 1·0 per cent. solution was most effective, killing the virus in from five to ten minutes.

Fowl pox virus was obtained from the comb and throat crusts of fowls on the eighth to tenth days of infection ; the crusts were dried in vacuo, ground up in distilled water (1 : 20) and filtered through filter paper, the filtrate being added to the disinfectant solutions in tubes.

" Trosilin " in 0·5 to 1·0 per cent. solution, 2·5 per cent. " sulfoliquid " and 3 per cent. phenol were of equal value. Caustic soda was unsuitable as a disinfectant for both viruses in the concentrations used (one per cent. took up to 30 minutes to kill Borna disease virus and two per cent. took up to one hour to kill fowl pox virus).

The authors review the literature on the disinfection of these viruses.—J. E.

GRASSNICKEL, F. W. (1933). Die Gasbehandlung der Räude. [**Gas Treatment of Mange**].—*Prag. Arch. Tiermed.* **13.** 179-198 and 227-240. [4 pp. refs.]

The author gives a valuable and extensive review of the treatment of mange in animals, particularly the horse, by sulphur dioxide gas applied in a special gas-proof box containing the animal's body, it's head being in the open. The gas is used in a concentration of 4 or 5 per cent. in air and about one hour's exposure is given.

Sulphur dioxide is a poisonous gas, which can be harmful both by absorbtion through the skin in overheated subjects (only) and by inhalation. Grassnickel discusses this toxic action as it affects all the common domestic and laboratory animals as well as mankind, with particular reference to its occurrence in animals being treated for mange and in persons in charge of SO_2 plants.

The construction of treatment boxes is considered with detailed references to numerous authors and advice is given on antidotal measures for cases of poisoning.

SO_2 inhaled by mammals in an atmospheric concentration of 0·04 per cent., acts as an irritant to the respiratory mucosa, causing a bad cough and respiratory distress. Death may follow in a few minutes to hours from pulmonary oedema. Intoxication through the skin is always accompanied by severe perspiration and the skin becomes scalded and, after an initial period of unrest, the animals become soporific or may walk into and press against objects. For horses poisoned by SO_2, the most important therapeutic measure is venesection with rest in an open space. Heart stimulants are also indicated.—J. E.

I. DREESBACH, F. (1932). Erfahrungen mit Taeniasept in der Hundepraxis. [**Experience with Taeniasept in Dog Practice**].—*Berl. tierärztl. Wschr.* **48.** 557.

II. HAWN, M. C. (1933). **The Value of Kamala as a Tenicide for Young Turkeys.**—*J. Amer. vet. med. Ass.* **83.** 400-404. 2 tables. [5 refs.]

III. STETTER, R. (1933). " Nemural ", ein neues Bandwurmmittel für Hunde und Katzen. [**" Nemural ", a New Taenicide for Dogs and Cats**].—*Münch. tierärztl. Wschr.* **84.** 385-389. 2 tables. [9 refs.]

IV. RITTER, H. (1933). Die Behandlung der Magenerweiterung und Dündarmverstopfung des Pferdes durch Beigaben von Paraffinum liquidum. [**Treatment of Dilated Stomach and Impaction of the Small Intestine of the Horse with Liquid Paraffin**].—*Inaug. Diss. Berlin.*

I. " Taeniasept " which, according to the makers' declaration, contains filicin, thymol and extract of areca nut, was used in 21 cases of tapeworm infestation and is considered worthy of further trial.

II. Kamala was tried in doses varying between 0·25 and 5 grains for the removal of cestodes from young turkeys 25 to 80 oz. in weight. It proved,

however, to have little effect upon the worms and to be too dangerous a drug for turkeys weighing less than 28 oz.

III. This synthetic drug, which may be described as a double combination of "arecoline" and "atoxyl", has been tested by Stetter on 70 dogs and six cats. In 96·8 per cent. of the infected animals worms were expelled and he concludes that the treatment is very effective. [No examination appears, however, to have been made for evidence of infestation remaining after the treatment].

IV. Ritter reports observations on 188 cases, some treated with liquid paraffin and some not so treated. He considered this drug to be a very useful adjunct to treatment, as it shortens the duration of the condition and increases the chances of recovery.—E. L. TAYLOR.

MARCENAC. (1934). Pouvoir hémostatique du citrate de soude. [**Haemostatic Power of Sodium Citrate**].—*Bull. Acad. vét. Fr.* **7.** 67-70. [16 refs.]

The author uses an intravenous injection of sodium citrate (30 g. in 90 c.c. distilled water) as a prophylactic against haemorrhage before certain operations on the horse. This is a maximum dose and if exceeded is likely to cause shock.

The anticoagulant action of sodium citrate in a lower dilution is curious, but the mechanism by which these antagonistic effects are produced is not understood.—J. E.

POISONS AND POISONING.

MACDONALD, R. A. S., & PURCHASE, H. S. (1934). **Notes on Arsenical Poisoning in Cattle.**—*Vet. Rec.* **14.** 644-645. 1 table.

In a country such as Northern Rhodesia, where dipping of cattle is extensive and anti-locust sprays are in use, cases of arsenical poisoning of stock fall into the following three main groups :– (1) carelessness associated with the use and disposal of dipping solution ; (2) grazing where locust " hopper " control spraying has been carried out, and (3) malicious – both locust poison and dip can be easily obtained.—HARVEY S. PURCHASE.

I. VELU, H. (1934). Intoxication fluorique pendant la vie foetale. [**Fluorine Poisoning during Foetal Life**].—*Maroc. méd.* March 15th. 121. [3 refs.]

II. VELU, H. (1934). Darmous (fluorose chronique) et arrêt du développement. [**" Darmous " (Chronic Fluorosis) and Arrested Development**].—*Bull. Acad. vét. Fr.* **7.** 108-109. [1 ref.]

I. Velu describes changes in the temporary incisors of foals born in phosphate areas : the centrals which erupt on the 10th day after birth are normal ; the laterals which erupt at one month show erosions and the corner incisors which erupt at six months are considerably malformed. As, under experimental conditions, it requires at least six months of chronic fluorine poisoning to cause teeth lesions in sheep, the author considers that the poisoning of the foals must have occurred *in utero*.

II. As a further clinical example of chronic fluorosis (" darmous ") of the phosphate areas of Morocco, Velu gives evidence of arrested development (stunted growth) of young cattle, horses and mules bred in affected areas. For comparison he tabulates the weights of affected animals and those of animals of similar age bred on farms not far distant, but away from the phosphate rock.

Sheep grow at a normal rate and only show teeth lesions.—J. E.

OXER, D. T. (1933). **Carbon Tetrachloride. A Note on its Toxicity for Sheep.**—*J. Coun. sci. indust. Res. Aust.* **6.** 279-284. 1 fig., 1 table. [16 refs.]

This paper records the effects of repeated administration of carbon tetrachloride to adult Romney-Southdown cross ewes and *post-mortem* findings in two other experimental animals. The ewes were hand fed in small areas with oaten and lucerne chaff, oats and bran. In addition, salt was available and bone flour was added to the ration at the rate of one half ounce per sheep per day. The ewes were treated periodically with 2 c.c. carbon tetrachloride in 3 c.c. liquid paraffin, in order to check the development of parasitic infestation resulting from the heavy stocking of the small area. Observations showed that after each administration of the carbon tetrachloride drench the ewes showed certain toxic symptoms, chief of which was marked loss of appetite. Lethargy and somnolence and gastro-intestinal disturbances were not noticeable. Loss of appetite resulted in quite considerable reduction of the amount of food eaten ; actually on the first day after the fourth treatment only 30 lb. of food was eaten by 118 ewes. In consequence of these observed effects, routine drenching was discontinued and an experiment was carried out to determine the extent of liver damage due to carbon tetrachloride. One sheep was given 2 c.c. carbon tetrachloride in 3 c.c. liquid paraffin. It showed loss of appetite and was slaughtered 52 hours after treatment. Microscopically the liver was normal but there was slight hyaline degeneration of some of the convoluted tubules of the kidney. Another sheep was dosed with 15 c.c. of the drug in 15 c.c. liquid paraffin. At *post-mortem* examination after 52 hours the liver showed marked lobular necrosis involving about 50 per cent. of the liver tissue. Microscopically, cells of the central portion of the lobules showed necrosis. There was also an intense congestion : the kidneys were normal. The opinion is expressed that there is a different mechanism of intoxication in sheep from that occurring in dogs and that liver necrosis is not essential for the production of toxic symptoms. It is indicated that calcium deficiency, feeding of concentrates, depasturing on certain crops, an excessively fat condition and exposure to cold bleak weather are possible predisposing factors in increasing the toxicity of the drug.

It is stated that it is conceivable that loss of weight and interference with wool growth consequent upon the loss of appetite may counterbalance the beneficial effect of the drug, especially where it is being used to control a worm infestation that is not very heavy.—H. McL. GORDON.

HÉZON, & SALLIÈRE. (1934). Sur plusieurs morts dues à une intoxication par le trèfle incarnat chez le Cheval. [**Poisoning of Horses by Red Clover**].—*Bull. Acad. vét. Fr.* **7.** 333-334.

This is a report of the poisoning of horses which had been fed solely on red clover for several weeks. Illness started at the time of seed formation ; the symptoms included slight colic with tympany, a small pulse and lack of bowel action. Death occurred 24 to 36 hours after the onset of symptoms. Autopsy showed a nearly empty alimentary canal and slight degeneration of the liver and kidneys.—J. E.

PHYSIOLOGY.

COOK, F. W., & DEARSTYNE, R. S. (1934). **Hematology of the Fowl. A. Studies on Normal Avian Blood. B. Studies on the Hematology of Avian Typhoid.** —*North Carolina Agric. Expt. Sta. Bull.* No. 44. pp. 51. 2 figs., 2 plates, 6 tables, 6 graphs. [18 refs.]

A. This is a careful determination of the morphology and enumeration of the cellular elements and haemoglobin content of the blood of the normal fowl. Studies were made of 80 normal birds. The method used in the studies was a modification of the supravital technique. A brief summary is given of the origin of the cells of the circulating blood. The haemoglobin content, determined colorimetrically with the Newcomer haemoglobinometer, showed, in the greatest number of instances, between 8·1 to 9·0 g. per 100 c.c. of blood.

Numerical count of erythrocytes showed wide extremes, the highest percentage of instances (52 per cent.) of the 80 studies made lying between 2,510,000 and 3,250,000 per c.mm., one count running less than two million and two over four million. The total white cell count showed 61 (76·3 per cent.) of the 80 birds to have a count of 20,000 cells or less per c.mm., the greater number having 11,000 to 15,000. The highest extreme showed 47,000 and the lowest 3,000 per c.mm. In the differential studies of white cells, the heterophile count was found to be from 41 to 45 per cent., the eosinophiles from 1 to 3 per cent., the monocytes from 7 to 15 per cent., the small lymphocytes from 21 to 25 per cent. and the intermediate lymphocytes from 1 to 3 per cent. Large lymphocytes were absent in 54 of the 80 studies, while the remainder showed 1 to 3 per cent. of this type.

B. In all studies made, the method of infection was by oral inoculation of a saline emulsion of a 24-hour culture. The course of the disease was determined by 74 studies on 30 artificially infected birds, and, for this purpose, the disease was divided into four periods.

During the period of incubation (14·5 to 92·5 hours after inoculation), the total white cell count, the heterophiles and monocytes increased, and the erythrocytes, haemoglobin and lymphocytes decreased. The morphology of the cells showed no change. In the prodromal period (56·5 to 108·2 hours), the total white cell count, heterophiles, small lymphocytes and erythrocytes continued their trends observed in the period of incubation. The haemoglobin content continued to decrease. Morphologically immature monocytes predominated. In the period of fastigium (from 70 to 75 hours to the commencement of the period of decline), the blood trends noted in the prodromal period were emphasized and there was a very marked increase in the total white cell count. The periods of decline and convalescence showed a trend tending to return to normal.—R. F. Gordon.

Flexner, L. B. (1934). **The Chemistry and Nature of the Cerebrospinal Fluid.** *Physiol. Rev.* **14.** 161-187. 1 table. [96 refs.]

This is a valuable review which is not abstractable. Two paragraphs are here quoted for the purpose of giving a glimpse of the present consensus of opinion on the nature of cerebrospinal fluid :–

" Cerebrospinal fluid probably arises in large part from the highly vascular chorioid plexuses. To fluid from this source is added a relatively small, perhaps insignificant amount of fluid from the ependymal cells of the ventricles. The ventricular fluid with these origins slowly flows into the subarachnoid space where it receives an addition, unknown in quantity but probably small, from the perivascular spaces of the brain and, in the opinion of some, from the blood vessels traversing the subarachnoid space. From the subarachnoid space, the fluid drains into the venous sinuses of the dura mater."

" The cerebrospinal fluid is not a dialysate in equilibrium with the blood plasma. Nor is it to be regarded as an ultrafiltrate for the pressure in the capillaries of the chorioid plexus is too small to account for the free energy change which takes place in the formation of the fluid. The fluid, on the basis of present evidence, is to be considered a secretion with the understanding that the term secretion means that cells must do work in the formation of the fluid."

—J. E.

EGEHØJ, J. (1933). Hovedets lymfekarsystem hos kvaeg. [**The Lymphatic System of the Head in Cattle**].—*Skand. VetTidskr.* **23.** 662-672. 1 fig. [5 refs.] [English summary]. [*Verbatim* translation in *Dtsch. tierärztl. Wschr.* **42.** 333-336].

The examinations show that the medial and lateral retropharyngeal lymph glands receive dyes that have been deposited hypodermically from a considerable part of the head. From the masseter muscles and the medial pterygoid muscles lymphatic vessels lead to the parotid, mandibular and medial and lateral retropharyngeal glands; from the temporal and buccal muscles, to the mandibular, parotid and lateral retropharyngeal glands; from the muscles of the tongue to the mandibular, lateral and medial retropharyngeal glands; and from the caninus muscle and from the depressor and levator of the upper lip to the mandibular and parotid glands. Connections *via* lymphatic vessels between the said muscles and the lateral and medial retropharyngeal glands have not been demonstrated previously.—H. C. BENDIXEN (COPENHAGEN).

I. ANDERSON, J. (1934). **The Excretion of Oestrin in the Urine of the Pregnant Cow.**—*Vet. J.* **90.** 295-298. 2 tables. [4 refs.]

II. MARTINOVIC, P. N. (1934). L'ovogenèse post-natale chez les Mammifères. Recherches faites sur les ovaires de Brebis sexuellement mures. [**Post-Natal Ovogenesis in Mammals. Research on the Ovaries of the Ewe**].—*C. R. Soc. Biol. Paris.* **116.** 674-675. [3 refs.]

III. DEMMEL, M., & WITZIGMANN, J. (1934). Die klinische Beurteilung des mikroskopischen Untersuchungsbefundes des Vaginalsekretes bei der Hündin. [**Clinical Interpretation of Microscopical Findings in the Vaginal Secretion of the Bitch**].—*Arch. wiss. prakt. Tierheilk.* **67.** 489-502. [28 refs.]

I. To detect the presence of oestrin, urine from pregnant cows of the zebu variety was treated with sulphosalicylic acid, filtered and injected into castrated female mice. It was found that the amount of oestrin excreted in the early stages of pregnancy is very small. It increases, however, from the 93rd day, until a maximum concentration of 1,100 mice units per litre is attained towards the end of pregnancy.

II. An examination of ovaries removed from ewes of various ages shows that epithelial cells may leave the periphery and pass towards the centre of the ovary, where they become isolated in the germinal epithelium. It is suggested that these cells gradually develop into true ovocytes during post-natal life.

III. It appears that the character of the vaginal discharge from normal bitches varies according to the phase of the oestral cycle. In the interoestral period, neucleated epithelial cells may be seen in the discharge and leucocytes are present in small numbers. The leucocytes disappear from the discharge during oestrus and do not appear in large numbers until the puerperium. Bacteria, mainly streptococci, staphylococci and diplococci, are constantly present and are numerous during oestrus, pregnancy and at the puerperium. Their presence does not necessarily indicate a pathological condition of the genital tract.

The diagnosis of metritis is greatly assisted by examination of stained vaginal smears, for an abnormal increase of leucocytes, especially polynuclears, indicates an inflammatory condition of the genital tract. No specific infective agent was found to be the cause of pyometra or endometritis. It is probable that such conditions are set up by the entry into the uterus, through a patent cervical canal, of bacteria normally present in the vagina.—J. A. NICHOLSON.

WATSON, R. H. (1933). **The Concentration and Distribution of Phosphorus in the Blood of Merino Sheep on Pasture.**—*Aust. J. exp. Biol. med. Sci.* **11.** 252-260. 5 tables. [15 refs.]

In the course of 80 observations on 40 sheep on natural pasture in the Adelaide district of South Australia, from 16·5 to 20·8 mg. (mean 18·5 mg.) of phosphorus per 100 c.c. of blood was found to be present. Of this 2·8 to 5·9 mg. (mean 4·5 mg.) was inorganic, 3·4 to 6·0 mg. (mean 4·8 mg.) organic acid-soluble, and 8·0 to 11·3 mg. (mean 9·3 mg.) organic acid-insoluble. With other sheep on other pastures a somewhat wider range of values was found. The collection of the blood and the convertion of the phosphorus into the inorganic form are described in detail. The estimations from the inorganic form were made according to the method of Fiske and Subbarow [(1925. *J. Biol. Chem.* **66.** 375].

—E. MUNCH-PETERSEN.

PEIRCE, A. W. (1933). **The Effect on the Body-Weight and Wool Production of Merino Sheep of adding Sulphur to the Diet.**—*J. Coun. sci. indust. Res. Aust.* **6.** 294-298. 2 tables. [12 refs.]

STEYN [this *Bull.* **3.** 571.] reported some experiments in which increases in body weight and wool production followed feeding flowers of sulphur to sheep. It has been found by other workers, however, that rats and dogs cannot utilize sulphur by synthesizing the sulphur-containing amino acid cystine [the form in which sulphur is present in wool]. Investigations were therefore undertaken to determine whether feeding flowers of sulphur would lead to an increased growth of wool in sheep on a diet which experience has shown to contain too little cystine to allow normal wool production. Two groups of five adult Merino sheep were placed on a carefully determined basal diet, and one group received 2 gm. of sulphur daily. The results showed that the addition of sulphur had no significant effect on either the body weight or wool production over a period of 32 weeks.

Peirce discusses STEYN's experiments and points out that they were unsatisfactory in that the sheep lacked uniformity and the diet during the experiment was apparently greatly superior to that which the sheep had been previously receiving. [SEDDON and CHAMBERLIN – this *Bull.* **4.** 545. – also conducted an experiment recently, wherein it was found that sulphur had no effect on the body weight or wool production].—W. I. B. BEVERIDGE.

I. ASTBURY, W. T., & WOODS, H. J. (1933). **X-Ray Studies of the Structure of Hair, Wool and Related Fibres. II. The Molecular Structure and Elastic Properties of Hair Keratin.**—*Philos. Trans. Roy. Soc. London. Ser. A.* **232.** 333-394. 18 text figs., 2 plates, 4 tables. [Numerous refs.]

II. BARRITT, J. (1934). **The Distribution and Origin of Sulphur in Wool. I. Methionine in Wool.**—*Bio-chem. J.* **28.** 1-5. 1 table. [35 refs.]

I. The molecular structure and elastic properties of mammalian hair, spines etc., are discussed from the examination of several hundred X-ray photographs.

II. The methionine content of various wools was determined. It was shown that the amount present did not materially affect previous work on the relation between total and cystine sulphur in wool, which indicated that substantially all the sulphur in wool could be accounted for as cystine. The suggestion is made that methionine occurs widely in feeding stuffs and grasses and may play an important role in the ultimate synthesis of wool and hair proteins.

—G. D. SHEARER.

THOMAS, J. E. (1933). **The Value of Greenstuff and Some Substitutes in the Ration of the Laying Fowl.**—*Aust. vet. J.* **9.** 202-207. 1 fig., 3 tables. [9 refs.]

The value of greenstuff in the diet of the laying fowl is generally recognized, but the provision of an adequate supply throughout the year often presents a difficulty. Since resource has often to be made to substitutes, the value of those most commonly used was investigated.

An experiment was carefully planned, with due regard to statistical requirements, to determine the effect on egg production, body weight, mortality and yolk colouration of the addition of greenstuff (lucerne or barley), sprouted oats or lucerne chaff to a basal diet containing no greenstuff. The greenstuff produced a significantly greater egg yield than did lucerne chaff which was superior to sprouted oats, while the latter was not significantly superior to the control basal diet. Significant loss of weight and avitaminosis A were observed only in the control group on the basal diet with no greenstuff. The avitaminosis A caused a high mortality, marked loss of weight and a diminution in egg production. It is considered that lucerne chaff and sprouted oats, when comprising about 20 per cent. of the ration, provide sufficient vitamin A for maintenance of health, but are not as effective as greenstuff in maintaining egg production. Greenstuff and lucerne chaff proved to be satisfactory sources of yolk pigment but the group receiving sprouted oats produced eggs whose yolks were a slightly paler yellow than those in the eggs of the control fowls on the basal diet. The role of vitamin A in nutrition and its relation to plant pigments are discussed.—W. I. B. Beveridge.

TECHNIQUE.

Sanchis Bayarri, V., & Montoliu Volant, C. (1934). Nueva tecnica para el diagnostico serologico del kala-azar. [**New Technique for the Sero-Diagnosis of Kala Azar**].—*Med. Paises calidos.* **7.** 12-18. [French summary]. [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 658. Signed by C. M. W.]

In carrying out the antimony test for kala azar the authors advise the use of a 4 per cent. solution of urea stibamine in physiological saline and a 1 in 5 and 1 in 10 dilution of the serum, which has previously been heated to 56°C. for half an hour. The precipitate obtained at the point of contact of the solution and serum is a very definite one, the reaction being absolutely specific for kala azar.

I. & II. Halvorson, H. O., & Ziegler, N. R. (1933). **Application of Statistics to Problems in Bacteriology. I. A Means of Determining Bacterial Population by the Dilution Method. II. A Consideration of the Accuracy of Dilution Data Obtained by Using a Single Dilution.**—*J. Bact.* **25.** 101-121 and **26.** 331-339. 1 fig., 5 tables. [36 refs.]

III. Richards, O. W., & Jahn, T. L. (1933). **A Photoelectric Nephelometer for Estimating the Population Density of Microorganisms.**—*Ibid.* **26.** 385-391. 2 figs. [9 refs.]

I. & II. The first two articles are statistical in nature and deal with the various problems involved in determining a bacterial population by the dilution method. The first paper is confined to the development of equations to be used for the evaluation of bacterial populations by this method. The second paper deals specifically with the problem of the accuracy obtained by using a series of tubes inoculated with a single dilution. It has previously been pointed out that the accuracy of dilution data depends largely upon the number of tubes used and that, in order to get reliable results, it is necessary to use a large series. The authors believe that in the case of a single dilution the accuracy also depends upon

the bacterial population. Developing their theme, they give equations showing how the data obtained with a single dilution vary with the bacterial population. It is, therefore, not possible to determine the accuracy of the data without having *a priori* knowledge of the bacterial population. This limitation of accuracy can be largely overcome by using several dilutions.

III. The third paper describes by the aid of drawings an electric apparatus for the determination of bacterial population according to its density. It depends upon the volume of light absorbed by the cells and as this absorption is a function of both the content and size of cells, measurements taken are a combination of these two factors.—R. LOVELL.

SOLDATI, R. (1934). Un nuovo tipo di pneumoscopio. [**A New Pneumoscope (To Record Movement of the Thorax)**].—*Profilassi.* **7.** 258-259. 3 figs. [Abst. from English and French summaries].

The author describes a new type of pneumoscope, an instrument which is attached to the ends of a broad band passing round the body of horses to record by a moving pointer the amplitude of the respiratory movements of the thorax. —J. E.

MISCELLANEOUS.

HENRY, M. (1933). **The Transport of Horses by Sea and Land.**—*Aust. vet. J.* **9.** 208-212.

This article is a synopsis of a lecture given to a military college.

TRANSPORT BY SEA has only within comparatively recent times had proper veterinary control. During the South African war, 3 and 6 per cent. of horses died while travelling from Australia and England, whereas, during the Great War, losses on ocean routes barely exceeded 1 per cent.

The first essential is that none but healthy horses should be shipped. Once on board, the principal consideration is ventilation. The greatest obstruction to maintaining an efficient ventilation is a following wind and, to combat this, it is sometimes necessary to turn the ship about and steer into the wind for a little while. The ship should spend as little time as possible in ports, as this also leads to stagnation of the air. Apart from the usual requirements of feeding and watering, it is important that only a small amount of grain be allowed and, while passing through the tropics, grain should be entirely withheld. Horses may be provided with individual stalls or may be placed loose in pens of four or eight. As much exercise as possible should be given and, for this purpose, the decks should be covered with coir mats or ashes. In the treatment of sick horses, bringing the affected animals up on deck is found to be of greater value than treatment with drugs or sera.

TRANSPORT BY RAIL.—The methods of arranging horses in trucks in various countries is discussed. In America, mortality from so-called shipping fever has led to the regulation that horses must not be kept in trucks for more than 28 hours without being unloaded, fed and watered.—W. I. B. BEVERIDGE.

—. (1934). Huitième session du comité de l'Office International des Epizooties. [**8th Session of the Committee of the Office International des Epizooties**]. —*Bull. Off. internat. Epiz.* **8.** No. 1. pp. 534.

The annual meeting of the Office was held in Paris from May 29th to June 2nd and 27 out of 44 countries which support the Office were represented by delegates, of which a list is given [p. 446]. The full report occupies the whole of No. 1 of Vol. 8 of the Office's Bulletin.

WEHRLE (Germany), the president of the Office, resigned on his retirement from office in the Reichsgesundheitsamt, and EERGER (Holland) was elected president for three years.

Ten special reports were presented and discussed: they included:– E. LECLAINCHE, "The Sanitary Situation in 1933"; A. THEILER & H. H. GREEN, "The Osseous Dystrophias of the Domestic Animals"; R. MANNINGER, "Critical Considerations on the Cause and Prophylaxis of Hemorrhagic Septicaemia"; F. GERLACH, also L. F. D. E. LOURENS, "The Standardisation of Biological Products"; C. CERNAIANU, "The Infectious Diseases of Poultry"; A. M. RACHAD, "Fowl Plague"; M. RINJARD, "Johne's Disease in France" and K. J. SKRIABINE & R. S. SCHULZ, (1) "The Campaign against the Moniezioses and the Cestodes of Sheep" and (2) "The Campaign against the Helminthiasis of Poultry."

In addition, EYRAUD sent a communication on dourine and its prophylaxis and S. KONDO & N. NAKAMURA a communication on vaccine against fowl plague. Reports on rabies in Germany, in Lithuania, and in Czechoslovakia in 1933 and in Yugoslavia in 1932 and 1933 were also furnished. LECLAINCHE gives a brief report of his work as director of the office.

[All the special articles are being abstracted separately in this *Bull.*].—J. E.

GERLACH, F. (1934). La standardisation des produits biologiques. [**Standardization of Biological Products**].—*Bull. Off. internat. Epiz.* **8.** 156-191. 6 tables. [1 ref.]

LOURENS, L. F. D. E. (1934). Standardisation des produits biologiques, des sérums et des vaccins. [**Standardization of Sera and Vaccines**].—*Ibid.* 192-240.

These papers, which are important contributions to the necessity for the standardization of biological products, should be consulted in the original by those interested.

Gerlach discusses the methods which should be employed for the standardization of a number of products. Anti-swine erysipelas serum should be titrated against cultures of high virulence in the mouse or the pigeon and compared with an international standard serum available to all laboratories. For anti-anthrax serum, the method of Sobernheim is recommended; this consists of the intravenous injection of rabbits with graded doses of serum followed by the subcutaneous inoculation of a small dose of culture. The other preparations which are mentioned are:– fowl cholera antiserum, haemorrhagic septicaemia (porcine) antiserum, tetanus antitoxin, blackquarter antiserum and culture filtrates, swine fever antiserum, foot and mouth disease antiserum, rinderpest antiserum and sheep pox antiserum. The standardization of tuberculin and mallein is discussed; in the case of the former, intracutaneous guinea pig tests are recommended but, according to the author, no satisfactory method, apart from tests in glandered horses, has yet been devised for mallein.

Lourens stresses the need for international control over the preparation and distribution of vaccines and sera. While he is opposed to institutes which are run directly by the state, he advocates the interdiction of all biological products except those which are regularized in respect of potency and purity by the Government. He suggests that the Office International des Epizooties should be invited to set up in each country not less than two laboratories to control methods of standardization for vaccines, sera and any other prescribed biological product.

An appendix furnishes details of the methods at present in vogue in the different countries of the world.—R. E. GLOVER.

OFFICIAL AND OTHER REPORTS.

British Guiana. (1934). **Department of Agriculture, Report of the Livestock Division for the Year 1933.** [Bone, T.]—*Rep. Direct. Agric. British Guiana, 1933.* pp. 31-33.

The state of the livestock industry is described [this *Bull.* **4.** 686].

With reference to animal health, a brief account of an outbreak of anthrax in cattle is given. Mal de caderas caused high mortality in horses on the intermediate savannahs.

The following livestock returns are given :– 160,000 cattle, 5,600 horses, 1,600 mules, 7,600 asses, 170 buffaloes, 35,000 sheep, 22,400 goats and 18,800 pigs.—J. E.

Tunis. (1934). L'activité de l'Institut Arloing (Laboratoire du Service de l'Elevage) pendant l'année 1933. [**Work of the Arloing Institute for 1933**]. —pp. 32. Tunis : J. Aloccio. [8vo].

The services of the laboratory are in great demand, especially for diagnosis. 1,639 specimens etc., were reported on during the year.

Johne's disease has been causing considerable uneasiness in certain districts. An outbreak of " equine typhoid fever ", said to be caused by a Gram-negative cocco-bacillus which was agglutinated by T. A. B. C. serum (*Bact. typhosum*, *Bact. paratyphosum* types A, B and C), is recorded. An auto-vaccine was used with apparent success.

Tuberculosis in recently imported birds is recorded. An acute and fatal disease of sheep showing " pushing " and other cerebral symptoms is described. Attempts to infect healthy stock experimentally with various materials has failed. Plant poisoning is suspected to be the cause. Studies into the cause of infectious paraplegia of horses continue. A streptococcus is often found in cases of this disease.

A mastoiditis with brain abscesses in pigs, which appears to be enzootic, has been studied and a pyogenic bacillus is said to be the causative agent.

Rationing experiments, in particular with the use of olive oil by-products for milk cows, are in progress and these residues after extraction of the oil would appear to be able to replace to a large extent the use of other concentrates. Work on fodder crops suitable to the various localities is also in progress.

A dairy, apiary, poultry and small stockyard are also attached to the central laboratory for investigating agricultural and allied problems.

—Harvey S. Purchase.

BOOK REVIEWS.

Giltner, W. (1934). **Brucellosis. A Public Health Problem.**—*Michigan State Coll. Agric. Expt. Sta. Sect. Bact. Mem.* No. 1. pp. 118. 17 tables, 3 graphs. [209 refs.] [8vo.]

This monograph is a dissertation which was submitted in partial fulfilment of the requirements for the degree of Doctor of Public Health, University of Michigan. The author has made a synthetic study of the problem of brucellosis which is of great general interest. He is well equipped by his long association with the work on the genus *Brucella* and his direction of the Central Brucella Station in the Department of Bacteriology and Hygiene, to make such a study. The term brucellosis is used to include disease in man and lower animals due to any member of the genus *Brucella*.

After an interesting historical introduction, the subject is dealt with in various sections. The problem itself is dealt with as it occurs in various parts of the world and the statistical evidence is examined. After dealing with the bacteriology of

the disease, the author proceeds to discuss the solution of the problem, which involves a study of the means of diagnosis, epidemiology and prevention. As one means of prevention involves the control or eradication of sources of human infection, considerable attention is given to methods of control of brucella infection in dairy stock and this problem is compared in detail with methods of control of bovine tuberculosis.

The conclusion is reached that brucellosis is becoming a widespread and serious problem and that the disease remains conspicuously an industrial disease affecting the industrial age group, especially males. The goat, the cow and the pig seem to be the primary hosts of the three types of brucella, *Br. melitensis*, *Br. abortus* (bovine strain) and *Br. abortus* (porcine strain) respectively ; while the sheep, the horse, the mule, the rabbit and the domestic fowl not infrequently contract the disease. The control of brucellosis is a problem in animal hygiene. Some modification of the " area plan " may prove to be of value in the eradication of brucella infection in cattle and perhaps of brucella infection in swine and other animals. The author considers that vaccination of cattle and goats by the use of an avirulent, live culture is feasible and that vaccination may be a dernier ressort both in the case of man and the lower animals. Pending the eradication of brucella infection from the domestic animals, man must seek protection through pasteurization of milk, thorough cooking of meat and a judicious technique in the handling of animals and animal products.

He advises that brucellosis should not be regarded as a public health problem out of proportion to its real importance. It should, however, be watched carefully by public health officials, since it may become progressively more important.

The subject is dealt with in a well-balanced manner, giving a monograph of great scientific value. At no time is there over-statement of a case. The monograph will be of great interest and use to public health workers, veterinarians, bacteriologists and those interested in the production of milk and meat. For workers in the subject its value is enhanced by extensive reference to published work and to bibliographies covering a period of from 460 B.C. to 1932 A.D.

—L. B. Bull.

de la Rivière, R. (1934). L'immunité par mécanisme physico-chimique. **[Physico-Chemical Technique in Immunity].** pp. 73. 5 figs., 9 tables. [31 refs.] Paris : Masson et Cie. [8vo] [Fr. 18].

This monograph deals with a collection of results on serological and other reactions that have been investigated by the author and others during recent years. No attempt is made to explain the fundamentals of animal resistance on the basis of physico-chemistry. The fact that the reactions described are due to physical or physico-chemical changes in the mixtures is the apparent reason for collecting together these observations, many of which bear no other relationship to one another. The author indicates that the germicidal power of many substances is in direct proportion to their capacity to dissociate into ions. Interesting results are given of the increased germicidal effect of dyes following their irradiation. The subject of flocculation is dealt with, particularly the capacity of antigen-antibody combination to precipitate emulsions of benzoin.

Probably the most interesting part of the monograph is that which deals with the capacity of the red blood cells to adsorb toxins and other substances. Attention is also drawn to the functions of the red blood cell other than that of carrying oxygen.

Professor d'Arsouval has written a preface to the monograph in which he stresses the importance of physics and the physico-chemical approach to biological problems.—L. B. Bull.